Off-Campus Catalog

1953-54

- SCIENCE
- PHARMACY
- EDUCATION
- ENGINEERING
- AGRICULTURE
- HOME ECONOMICS

PURDUE UNIVERSITY 1953-54

Technical Extension Division

UNIVERSITY CALENDAR

1953

SEPTEMBER						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

OCTOBER						
S	M	T	W	T	F	S
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4	5	6	7	8	9	10
11	12	13	14	15	16	17
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25	26	27	28	29	30	31

NOVEMBER						
S	M	T	W	T	F	S
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8	9	10	11	12	13	14
15	16	17	18	19	20	21
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29	30					

DECEMBER						
S	M	T	W	T	F	S
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20	21	22	23	24	25	26
27	28	29	30	31		

1954

JANUARY						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

FEBRUARY						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

MARCH						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

APRIL						
S	M	T	W	T	F	S
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4	5	6	7	8	9	10
11	12	13	14	15	16	17
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25	26	27	28	29	30	

MAY						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

JUNE						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

JULY						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

First Semester

September 14
Orientation Examinations
September 17, 18, 19
Registration for First Semester
September 21
Classes begin
November 26
Thanksgiving holiday
December 19, noon
Christmas vacation begins
1954
January 4, 7 a.m.
Classes resume
January 23, noon
Classes end

Second Semester

January 25
Orientation Examinations
January 26, 27
Registration for Second Semester
January 28
Classes begin
April 14, 6 p.m.
Easter vacation begins
April 22, 7 a.m.
Classes resume
May 26, 6 p.m.
Classes end
May 30
Commencement

Summer Session

June 10
Orientation Examinations
June 12, 13
Registration for Summer Session
June 15
Classes begin
July 5
Independence Day holiday
August 7, noon
Classes end

The extension activities of Purdue University operate within the Division of Technical Extension. Information regarding the extension offerings of the University may be obtained by writing to the Dean, Division of Technical Extension, Engineering Administration Building, Purdue University, Lafayette, Indiana.

Division of Technical Extension

OFF-CAMPUS PROGRAM

Announcements for the Year 1953-54

PURDUE UNIVERSITY

Calumet

Fort Wayne

Indianapolis

Michigan City

Seventy-ninth
Year

LAFAYETTE, INDIANA

PUBLISHED BY THE UNIVERSITY

Student lounge areas at the Purdue Centers are popular places for relaxation and study between classes.

CONTENTS

Off-Campus Program 4

Special Services for Industry 4

Requirements for Admission 5

Grades and Honors 6

Fees 8

Correspondence Study 9

Freshman Plans of Study

- Engineering 11
- Chemistry, Physics, Mathematics 12
- Biological Sciences 13
- Social Science, English, Speech 14
- Industrial Education 15
- Agriculture 16
- Home Economics 17

Description of Courses 18

School of Pharmacy 28

Technical Extension Supervisors and Teaching Staff 45

Administrative Staff ..... Inside Back Cover

Address of Regional Offices ..... Back Cover

PURDUE UNIVERSITY

OFF-CAMPUS PROGRAM

Purdue University, a land-grant institution, extends its programs of study in science, technology, and agriculture through University Centers, which have been established in order to better serve the needs of the people of the state. The Off-Campus University Centers provide an opportunity for students, in many cases, to live at home and take regular University work. In addition, this state-wide program provides credit and non-credit courses, correspondence instruction, short courses, demonstrations, lectures, conferences, publications, and other formal and informal enterprises for the purpose of making available to the people of the state the educational resources of the University.

Degree Credit Courses. Degree credit courses carry residence credit (with certain limitations on graduate courses) and are identical in quality and content with courses given on the Lafayette campus. All instructors, full or part-time, are selected and approved by the heads of the various academic schools and departments. Courses are planned and supervised by the schools and departments in the same manner as on campus. Enrollment in a Center is enrollment in Purdue.

Non-Credit Courses. The University will offer non-credit classes, of an adult nature, which are within the scope of its teaching facilities. Any interested group may request assistance in the development of a course to meet its particular needs. A member of the extension staff will assist with the planning and operation of such a class.

Freshman Work. Freshman work acceptable toward a degree in the Schools of Engineering, Science, Pharmacy, Agriculture, Home Economics, and the Industrial Education Department of the Division of Education and Applied Psychology is offered through the off-campus program. Courses such as shop and military training, which are not offered off-campus, may be postponed until the end of the freshman year. Students may enroll on the Lafayette campus after completion of their first year, or may continue their studies at the Center if the required courses are available. However, students are cautioned to consult their advisors or center director concerning the amount of work they profitably can pursue off-campus.

The courses recommended in the freshman programs of studies, which follow **(and are so indicated by italic type)**, constitute a full college load and will require about 23 hours in class each week. After having completed a full freshman year's work, students may transfer to the campus as sophomores.

Special Services for Industry

The Division of Technical Extension will cooperate with individual industries in the development and operation of their industrial training

programs. However, such programs may be limited to the extent that facilities and staff are available. Such service is rendered without charges other than the regular fees assessed for student enrollment in classes.

At the present time cooperative programs of this kind are being offered to employees of Indiana industries. Typical examples of the programs which have been offered or are being offered are as follows:

Inland Steel Company. Specialized programs are operated to train mechanical, electrical, chemical and metallurgical technicians, and supervisory personnel.

International Harvester Company. Technical and cultural courses supplementing the workers' job activities are operated in formal classes.

Joseph E. Seagram and Sons, Inc. General interest courses with college credit are offered in the plant for groups wishing further education development.

Requirements for Admission

For admission to the freshman class one must present credit in 15 units of secondary-school work.

Of the fifteen units, seven are prescribed for all applicants, namely:

English ..... 3 units
History or Social Science..... 1 unit
Algebra
Engineering ..... 1½ units
Physical Education
for Men ..... 0 units
All others ..... 1 unit
Plane Geometry
Engineering ..... 1 unit
Physical Education
for Men ..... 0 units
All others ..... 1 unit
Science (with laboratory) ..... 1 unit

Three additional units must be chosen from English, languages other than English, mathematics, science, history, and social science.

For admission to the engineering schools the following subjects must be included:

Intermediate Algebra ..... ½ unit
Solid Geometry ..... ½ unit

The remaining five units may be chosen from any other subjects in which credit for graduation has been allowed in the secondary school, or in which entrance examinations have been passed.

An application for admission must be made on the proper form obtainable from any of the University Centers or from the Director of Admissions. The University prefers to receive the application at least two months in advance of registration. Applicants from high schools should apply as soon as possible after the beginning of their last semester in high school.

Admission with Deficiencies. No student is admitted with deficiencies unless he ranks in the upper third of his graduating class. He is not admitted to the Schools of Engineering unless he has completed both algebra and plane geometry. If he is deficient in solid geometry, he may make this up by taking a non-credit correspondence course or a non-credit course on or off campus. A deficiency in advanced algebra may be removed by a non-credit correspondence course or by completion of Mathematics 141.

Orientation and Placement Examinations. New students are required to take the following orientation tests: psychological, English, physical science and mathematics. A placement test in drawing may be given for those requesting an evaluation of previous experience. These tests are not entrance examinations.

Where facilities and enrollment in an University Center permit, students may be classified according to their abilities and training. The score on the English placement tests will determine whether a new student is assigned to English 1, 101, 103, or 238. The score on the mathematics placement test will determine whether the new student in engineering or in science (major in mathematics, chemistry, or physics only) will be assigned to Mathematics 131 or 141. The score on the engineering drawing test will determine whether the student in engineering will take G.E. 121 or 122. Additional information about placement in English, mathematics, and engineering drawing may be found under the department listing of the courses.

Grades and Honors

Each student will receive from his instructors a grade for each course in which he is enrolled at the close of a session. The student shall be responsible for the completion of all required work by the time of the last scheduled meeting in the course unless his assignment to the course has been properly cancelled. The grade shall indicate the student's achievement with respect to the objectives of the course.

A new grading system became effective with the beginning of the 1953 Summer Session. The system is as follows:

For credit courses:

A—highest passing grade

B

C

D—lowest passing grade; passing minimal objectives of the course.

E—conditional failure; failure to achieve minimal objectives, but only to such limited extent that credit can be obtained by examination or otherwise without repeating the entire course. This grade represents failure in the course unless and until the record is duly changed.

F—failure to achieve minimal objectives of the course. The student must repeat the course satisfactorily in order to establish credit in it.

For zero credit courses (including thesis research but not including laboratory portions of courses in which, for purposes of scheduling, separate course designations and separate class cards are used for the laboratory sections):

S—Satisfactory; meets course objectives.

Y—unsatisfactory; does not meet course objectives.

For incomplete work, either credit or non-credit:

O—incomplete; no grade; a temporary record of work which was interrupted by unavoidable absence or other causes beyond a

student's control, and which work was passing at the time it was interrupted. An instructor may require the student to secure the recommendation of the Dean of Men or the Dean of Women that the circumstances warrant a grade of Incomplete. On the record a grade of O will be equivalent to a W unless and until the record is duly changed.

Directed grades. The Registrar is directed to record the following grades and symbols under special circumstances.

W—Withdrew; a record of the fact that a student was enrolled in a course and withdrew or cancelled the course after the last date for late registration and adding courses.

WF—Withdrew Failing; a record of course cancellation after the last date for cancelling a course without grade, at which time, according to a statement from the instructor, the student was not passing in his work. This grade counts in all respects as a failing grade.

A grade of WF may be directed by the Dean of Men, the Dean of Women, or the Committee on Scholastic Delinquency and Readmissions when a student is dropped from a course for serious scholastic delinquency.

V—Visitor; a designation in lieu of any other grade for any student enrolled in a course as a visitor without credit.

Scholarship Index. For every student a scholarship index will be computed at the end of each semester.

Distinguished Students. Of the undergraduate students enrolled in curricula leading to degrees, and carrying at least fourteen semester hours of assigned work, those whose scholarship index at the end of any regular semester is equal to or greater than 5.00 are designated as distinguished students of that semester.

Engineering Students. Students enrolled in the schools of engineering must have attained a cumulative scholastic index of 3.2 or higher by the end of their second regular semester in Purdue University in order to continue as students in the schools of engineering; also at the end of their fourth regular semester their cumulative index shall be 3.2 or higher.

Probation. Any regular undergraduate student who fails at the end of a full semester to make a passing grade in a minimum of 12 hours of the work for which he is registered in that semester, or in all his courses if he is registered for less than 12 hours, shall be placed on probation for the next full semester in which he registers as a regular student. If, in this semester on probation, he passes 12 hours or all of the courses for which he is registered, his probation shall be ended. If, in this semester on probation, he fails to pass 12 hours, or all of the courses for which he is registered if less than 12 hours, he shall be dropped from the University. A student who has been dropped by this rule and who has been duly readmitted as a regular student will be placed on probation effective at once. For the purpose of this rule, a grade of incomplete will be considered as passing, and a grade of condition, failure, or un-

satisfactory will be considered as failing even though a condition is removed later. Probation status will be based upon grades due and received at the end of each semester, except that a grade change because of an error in reporting or recording a grade will require reconsideration of probation status.

Fees

Course Fees. Fees and deposits for each course are listed with the course descriptions in this catalog. Fees are paid to a representative of the University at the time of registration.

Veterans may submit in place of cash as payment for their fees a properly endorsed Veterans Administration form such as a Certificate of Eligibility and Entitlement (Public Law 346) or a Letter of Authority (Public Law 16). Whenever defects exist in such authorizations, and in the absence of authorization, the veteran is required to pay cash for fees and supplies under regulations applying to all students.

The veteran registering for the first time is advised to consult well in advance of registration with the Purdue officials of the Center at which he plans to register.

Breakage Fees. Course fees include the cost of normal breakage and wear and tear on equipment. An additional charge will be levied against individuals for excessive waste, loss, or breakage as may occur. Such special charges must be paid before course credit will be given.

Fees for Special Examinations. A fee of $10 is charged persons not regularly enrolled for at least 12 hours of work, for advanced-standing examinations or placement tests. A fee of $2 is charged students who are regularly enrolled for twelve hours or more of work for advanced-standing examinations, removal of condition, or placement tests. There is no fee for placement tests taken at regularly scheduled times. Neither is there a fee for the removal of an incomplete grade.

Refunds and Withdrawals. Course fees will be refunded under any one of the following conditions:

1. Withdrawal during first and second weeks of semester, 80 per cent refund.
2. Withdrawal during third and fourth weeks of semester, 60 per cent refund.
3. Withdrawal during fifth and sixth weeks of semester, 40 per cent refund.
4. Withdrawal after sixth week of semester, no refund.

Students who register for a course and do not attend class will be withdrawn as of the first day of class and entitled to a refund of eighty per cent of the course fees paid.

Deposits on equipment are subject to regular service and breakage charges.

Refunds are not transferable from one registration period to another or from one student to another.

To be eligible for a refund the student must notify the extension office and apply for a refund at the Center where he is registered at the time of his withdrawal.

Correspondence Study

Training is also given by correspondence study for high-school students and recent high-school graduates lacking certain subjects required for admission to the University or needing to refresh their knowledge of other courses in preparation for university work. Courses currently available are:

Elementary Algebra I. This course covers the first semester of high-school algebra.

Elementary Algebra II. Continuation of the first semester's work.

Advanced Algebra. Begins with a review of the topics studied in a basic course in algebra. In addition, the course includes linear equations, fractional and literal equations, systems of linear equations, radicals, exponents, quadratic equations, and systems of equations involving quadratics.

Plane Geometry I. This course covers the amount of geometry usually taught in the first semester.

Plane Geometry II. Continuation of the first semester's work.

Solid Geometry. Study of lines, planes, angles, prisms, cylinders, pyramids, cones, and spheres, with emphasis upon numerical problems, the drawing of space figures, and the relations of solid geometry to the mathematics given in the engineering courses at Purdue.

Plane Trigonometry. This course follows the same general plan as that taken on the campus by freshman engineers. The first part includes the use of trigonometric functions in solving triangles with either the natural values of the functions or by means of logarithms. The second part covers analytical trigonometry, including a study of identities, equation, radian measure, and inverse functions.

Review of Pre-College Mathematics. A review of important mathematical skills essential to success in college work; fractions, decimals, percentage, the metric system, the axioms of algebra, simple equations, exponents and radicals, factoring, quadratic equations, ratio, proportion, uses of dimensional equations, and formulas of geometry.

First Aid Toward Better English. Each term at Purdue many freshmen are required, because of their deficiencies in English, to enroll in a non-credit course in grammar, punctuation, and sentence structure. This correspondence course may be the means of avoiding the non-credit course and possibly of qualifying on the orientation tests for an advanced course in English composition.

For information on correspondence study courses write to the address given on the inside front cover.

Off Campus students study in a Purdue Center library. Three sides of the room are lined with shelves of books, technical journals and current publications.

Key to Abbreviations in Freshman Programs of Study

Approved plans of study for first- and second-semester freshmen enrolled in the various schools and options are given on the following pages. Courses recommended by the schools and departments are so indicated by *italic type*. The type of course as it applies to the student's plan of study for the program in which he is enrolled in indicated by the following abbreviations:

R —Required course

Rs—Required substitute, which replaces a required course listed in the general catalog.

el —Elective

op—Optional; may be substituted in place of required course.

FRESHMAN PLANS OF STUDY

Engineering

Undergraduate instruction in the School of Aeronautics, Chemical and Metallurgical Engineering, Civil Engineering and Engineering Mechanics, Electrical Engineering, and Mechanical Engineering leads to the degree of Bachelor of Science. In order to give the student sufficient time to adjust himself and to choose the branch of engineering for which he is best adapted, the following program of study during the freshman year is common for the curricula in all engineering schools.

First Semester

Course No.	Course Title	Credit	Fees	Type*
MA 141†	*Algebra and Trigonometry*	5	$40	R
ENG 101	*English Composition*	3	24	R
CHM 101	*General Chemistry*	4	43	R
HIST 205	*U. S. in World Affairs*	3	24	Rs
GE 121	*Engineering Drawing*	2	28	R
	Total	17		
PEM 112‡	Physical Activities	1	15	el
CE 100§	Plane Surveying	2	25	R
SPE 111	Public Speaking	2	16	Rs

Second Semester

MA 142†	*Analytic Geometry*	5	$40	R
ENG 238	*Introduction to Fiction*	3	24	R
CHM 102	*General Chemistry*	4	43	R
GVMT 301	*Elements of Democracy*	3	24	R
GE 122	*Engineering Drawing*	2	28	R
	Total	17		
PEM 112‡	Physical Activities	1	15	el
CE 6§	Plane Surveying	2	25	R
SPE 112**	Public Speaking	2	16	Rs
SPE 114**	Principles of Speech	3	24	R
PSY 120	Elementary Psychology	3	24	Rs

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* Key to abbreviations appears on page 10.

† MA 115, 112, 116 may be substituted for MA 141, 142.

‡ PEM 112 will be applied as a substitute toward credit in military training.

§ Students in Civil Engineering must have credit in CE 100 before taking CE 102, 104 (Summer Surveying Camp).

** SPE 111-112 may be substituted for SPE 114 requirement.

Science

The School of Science provides both introductory and advanced courses in the various fields of science as well as other subjects essential to a broad education, such as economics, English, government, history, modern languages, and speech. The student may fit himself for practical work in biology, chemistry, mathematics, physics, education, English, speech, history, economics, or modern languages, or for further training in a dental, medical, or law school. The instruction also prepares for teaching. Approved plans of study for the various options follow:

CHEMISTRY, PHYSICS, AND MATHEMATICS OPTIONS

First Semester

Course No.	Course Title	Credit	Fees	Type*
MA 141	*Algebra and Trigonometry*	5	$40	R
ENG 101	*English Composition*	3	24	R
ENG 185	Developmental Reading	⅔	30	R
SOC 100	*Introductory Sociology*	3	24	R
CHM 101†	*General Chemistry*	4	43	R
or				
PHY 240‡	*General Physics*	5	50	R
or				
ZOOL 160§	*Biology of Animals*	4	43	R
	Total 15⅔ or 16⅔			
PEM 112	Physical Activities	1	15	el
PEW 201	Physical Education	1	10	R
SPE 111**	Public Speaking	2	16	Rs
HIST 205	U. S. in World Affairs	3	24	Rs
AD 101	Survey of the Arts	3	24	el
C&T 102	Clothing the Individual	3	24	el
GE 121	Engineering Drawing	2	28	el

Second Semester

MA 142	*Analytic Geometry*	5	$40	R
GVMT 301	*Elements of Democracy*	3	24	Rs
SPE 114**	*Principles of Speech*	3	24	Rs
CHM 102†	*General Chemistry*	4	43	R
or				
PHY 241‡	*General Physics*	5	50	R
or				
PLSC 140§	*Introduction to Plant Life*	4	43	R
	Total 15 or 16			

ZOOL 160 or PLSC 140.

PEM 112	Physical Activities	1	15	el
PEW 202	Physical Education	1	10	R
SPE 112*	Public Speaking	2	16	Rs
F&N 101	Food Selection	2	16	el
PSY 120	Elementary Psychology	3	24	el
FOR 103	Conservation	2	16	el
GE 122	Engineering Drawing	2	28	el

* Credit will not be given for both SPE 111-112 and SPE 114.

* Key to abbreviations appears on page 10.

† For students majoring in chemistry.

‡ For students majoring in physics.

§ For students majoring in mathematics, except that PSY 120 may be substituted for Zool 160 or PLSC 140.

SCIENCE

BIOLOGICAL SCIENCES, PRE-PHARMACY, PRE-MEDICAL AND PRE-DENTAL OPTIONS

First Semester

Course No.	Course Title	Credit	Fees	Type*
ZOOL 160	*Biology of Animals*	4	$43	R
CHM 111	*General Chemistry*	3	35	R
MA 121**	*General College Mathematics I*	3	24	R
ENG 101	*English Composition*	3	24	R
ENG 185	*Developmental Reading*	⅔	30	R
FREN 101†	*Beginning French*	3	25	R
or				
GERM 101†	*First Course in Standard German*	3	25	R
	Total	16⅔		
SPE 111†	Public Speaking	2	16	Rs
PEM 112	Physical Activities	1	15	el
PEW 201	Physical Education	1	10	R
HIST 205	U. S. in World Affairs	3	24	Rs
SOC 100	Introductory Sociology	3	24	el

Second Semester

PLSC 140	*Introduction to Plant Life*	4	$43	R
CHM 112	*General Chemistry*	3	35	R
MA 122**	*General College Mathematics II*	3	24	R
SPE 114‡	*Principles of Speech*	3	24	Rs
FREN 102†	*Beginning French*	3	25	R
or				
GERM 102†	*First Course in Standard German*	3	25	R
	Total	16		
SPE 112‡	Public Speaking	2	16	Rs
PEM 112	Physical Activities	1	15	el
PEW 202	Physical Education	1	10	R
GVMT 301	Elements of Democracy	3	24	Rs

* Key to abbreviations appears on page 10.

† Those planning to major in one of the biological sciences or to enter medical or dental school should choose GERM 101 and 102. Subsitute GVMT 301, HIST 205, or SOC 100 where modern language is not offered. Students in the Pre-Pharmacy Option may substitute GVMT 301, HIST 205, or SOC 100 for modern language.

‡ Credit will not be given for both SPE 111-112 and SPE 114.

** In those centers where MA 121-122 are not offered, MA 141 or MA 111-112 may be snbstituted for MA 121.

SCIENCE

SOCIAL SCIENCE, ENGLISH, SPEECH AND ALL OTHER OPTIONS

First Semester

Course No.	Course Title	Credit	Fees	Type*
ZOOL 160	*Biology of Animals*	4	$43	Rs
GVMT 301	*Elements of Democracy*	3	24	R
ENG 101	*English Composition*	3	24	R
MA 121**	*General College Mathematics I*	3	24	R
FREN 101	*Beginning French*	3	25	R
or				
GERM 101	*First Course in Standard German*	3	25	R
	Total	16		
SPE 111†	Public Speaking	2	16	Rs
PEM 112	Physical Activities	1	15	cl
PEW 201	Physical Education	1	10	R

Second Semester

PSY 120‡	*Elementary Psychology*	3	24	R
SOC 100	*Introductory Sociology*	3	24	R
SPE 114	*Principles of Speech*	3	24	Rs
MA 122**	*General College Mathematics II*	3	24	Rs
FREN 102	*Beginning French*	3	25	R
or				
GERM 102	*First Course in Standard German*	3	25	R
	Total	15		
SPE 112†	Public Speaking	2	16	Rs
PEM 112	Physical Activities	1	15	el
PEW 202	Physical Education	1	10	R
HIST 205	U. S. in World Affairs	3	24	Rs

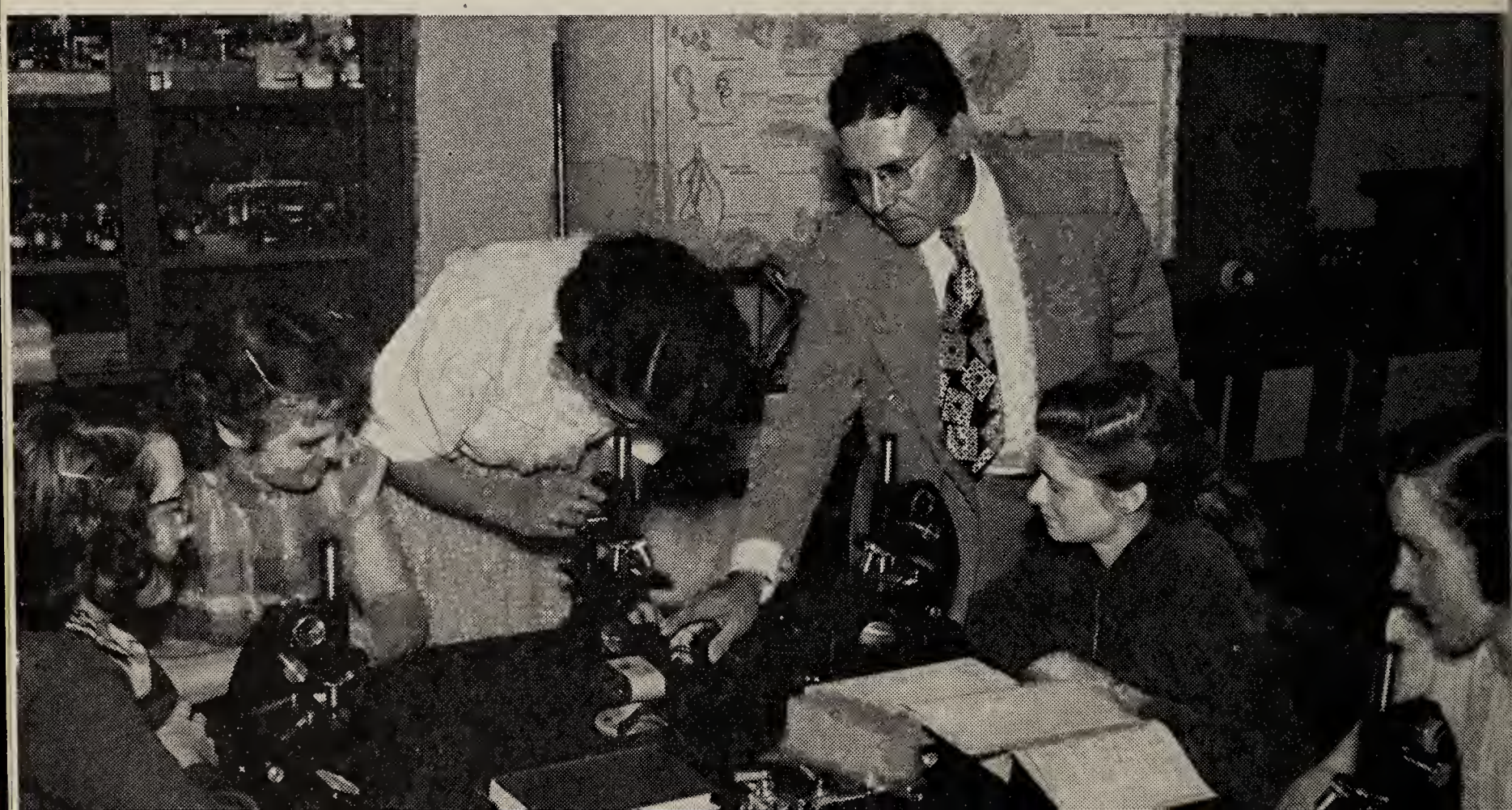
* Key to abbreviations appears on page 10.

† Credit will not be given for both SPE 111-112 and SPE 114.

‡ PLSC 140 may be substituted for PSY 120.

** In those centers where MA 121-122 are not offered, MA 141 or MA 111-112 may be substituted for MA 121.

A group of nurses receives special instruction in biology at the Ft. Wayne Center.



Industrial Education

The four-year curriculum in Industrial Education which leads to the degree of Bachelor of Science in Industrial Education is designed to prepare the student to qualify in one of the following fields: (1) vocational industrial teaching, (2) industrial arts, (3) school building service, (4) industrial training. Completion of this curriculum also fulfills the professional training requirements specified by the Indiana State Teacher Training and Licensing Commission. Individuals with qualified industrial experience may request an evaluation of it for credit purposes.

In order to achieve any of these objectives, each student is required to complete a basic curriculum which includes the subjects listed below. Provision is then made for majoring in one of the subject matter fields.

First Semester

Course No.	Course Title	Credit	Fees	Type*
MA 111‡	*Algebra*	3	$24	R
ENG 101	*English Composition*	3	24	R
GE 121	*Engineering Drawing*	2	28	R
HIST 205	*U. S. in World Affairs*	3	24	el
CHM 111	*General Chemistry*	3	35	R
	Total	14		
SPE 111†	Public Speaking	2	16	Rs
ECON 210	Principles of Economics	3	24	R
PSY 120	Elementary Psychology	3	24	R

Second Semester

MA 112*‡	*Trigonometry*	3	$24	R
SPE 114†	*Principles of Speech*	3	24	R
GE 122	*Engineering Drawing*	2	28	R
SOC 100	*Introductory Sociology*	3	24	R
CHM 112	*General Chemistry*	3	35	R
	Total	14		
SPE 112†	Public Speaking	2	16	Rs
ENG 238	Introduction to Fiction	3	24	el
ENG 202	Expository Writing	3	24	R
GVMT 301	Elements of Democracy	3	24	Rs
ECON 210	Principles of Economics	3	24	R
PSY 230	Educational Psychology	3	24	R

* Key to abbreviations appears on page 10.

† Credit will not be given for both SPE 111-112 and SPE 114.

‡ If MA 111-112 are not offered, MA 121-122 may be substituted.

Agriculture

The School of Agriculture trains students in many types of agricultural life work, including not only farming, but related educational and industrial activities. Several programs of study are offered in Forestry. Twelve departments in the School of Agriculture offer optional programs preparing students for jobs in research, teaching and extension, as well as various related commercial enterprises. Instructional work is based on fundamental training in biology, chemistry, and physics together with courses in history, economics, English, psychology, and other similar courses.

Agriculture students who may be taking training in basic science courses together with agricultural subjects as a part of the program of training at Purdue University Centers should be able to continue their work in residence at Purdue following their freshman year.

First Semester

Course No.	Course Title	Credit	Fees	Type*
ENG 101	*English Composition*	3	$24	R
CHM 111	*General Chemistry*	3	35	R
ZOOL 160	*Biology of Animals*	4	43	R
AGEC 100	*Farm Accounting and Farm Business*	3	24	el
PH 101	*Poultry Production*	3	25	el
	Total	16		
MA 111†	Algebra	3	24	el
CHM 101	General Chemistry	4	43	op
HIST 205	U. S. in World Affairs	3	24	el
PEM 112	Physical Activities	1	15	el

Second Semester

ENG 238	*Introduction to Fiction*	3	$24	el
CHM 112	*General Chemistry*	3	35	R
GVMT 301	*Elements of Democracy*	3	24	el
PLSC 140	*Introduction to Plant Life*	4	43	R
FOR 103	*Conservation*	2	16	el
ENT 100	*Introductory Entomology*	3	27	el
	Total	18		
SPE 114	Principles of Speech	3	24	R
MA 112†	Trigonometry	3	24	el
CHM 102	General Chemistry	4	43	op
PSY 120	Elementary Psychology	3	24	el
PEM 112	Physical Activities	1	15	el

* Key to abbreviations appears on page 10.

† See note p. 34.

Home Economics

The plan of study in Home Economics has two functions: to give the student training which will fit her to become a responsible citizen and an intelligent homemaker and housekeeper; to train her for a skilled occupation by which she may become self-supporting.

Young women trained in home economics have the opportunity to become teachers and supervisors, extension specialists, dietitians, managers of lunchrooms and tearooms, costume designers, commercial demonstrators, writers, nutrition workers, club leaders, interior decorators, and home demonstrators in extension.

Students interested in vocational home economics teaching; dietetics and nutrition; clothing and textiles; food management; costume designing, interior designing, and commercial designing; home economics in business, or the general course in home economics should enroll in the curriculum listed below. It is not recommended for those interested in the housing option.

First Semester

Course No.	Course Title	Credit	Fees	Type*
ENG 101	*English Composition*	3	$24	R
CHM 111	*General Chemistry*	3	35	R
ZOOL 160	*Biology of Animals*	4	43	el
AD 101	*Survey of the Arts*	3	24	R
C&T 102	*Clothing the Individual*	3	24	R
	Total	16		
MA 111‡	Algebra	3	24	el
HIST 205	U. S. in World Affairs	3	24	el
SPE 111†	Public Speaking	2	16	el

Second Semester

ENG 238	*Introduction to Fiction*	3	$24	op
SPE 114†	*Principles of Speech*	3	24	el
CHM 112	*General Chemistry*	3	35	R
GVMT 301	*Elements of Democracy*	3	24	el
PLSC 140	*Introduction to Plant Life*	4	43	el
F&N 101	*Food Selection*	2	16	R
	Total	18		
MA 112‡	Trigonometry	3	24	el
PSY 120	Elementary Psychology	3	24	R
SPE 112†	Public Speaking	2	16	el

* Key to abbreviations appears on page 10.

† Credit will not be given for both SPE 111-112 and SPE 114.

‡ If MA 111-112 are not offered, MA 121-122 may be substituted.

DESCRIPTION OF COURSES

Courses numbered 1 to 499 are primarily for undergraduate students. Courses numbered 500 to 599 are for undergraduates (usually junior and senior) and graduate students. Courses numbered 600 and above are primarily for graduate students.

For each course the first line of the description should be interpreted as follows: first the official number of the course; second the old course number in parenthesis; third, its special title; fourth, the number of class, laboratory and credit hours; and fifth, the fee for the course. For example, the following line:

AGRY 105 CROP PRODUCTION. Class 2, Lab. 2, cr. 3 $25 indicates that the course in Agronomy 105 is Crop Production, gives credit for three semester hours and costs $25.

School of Agriculture

Agricultural Economics

100. (1.) INTRODUCTION TO AGRICULTURAL ECONOMICS. Class 3, cr. 3 $24

Farm financial records, analysis of the farm business; factors affecting farm profits, agricultural geography; types of farming; and current problems in agricultural economics.

500. (101.) AGRICULTURAL PRICES. Class 3, cr. 3 $24

Analysis of prices and price movements of farm products; relation of prices of farm products to other prices. Price and production cycles, price forecasts, agricultural outlook, adjustment of farming to new price conditions.

Agronomy

105. (2.) CROP PRODUCTION. Class 2, Lab. 2, cr. 3 $25

Fundamental principles in crop production, distribution, rotations, soil relations; grain and forage crops, adaptation, characteristics, varieties, harvesting, storage, and marketing.

255. (27.) SOIL MANAGEMENT. Class 2, Lab. 2, cr. 3 $25

Must be preceded by Chem. 101, 111, or 117.

Soil management and fertility. Designed for students taking only one course in soils.

Animal Husbandry

111. (11.) TYPES AND MARKET CLASSES OF MEAT ANIMALS. Class 1, Lab. 4, cr. 3 $26

The selection of feeder and breeding stock suitable for the production of desirable market beef cattle, hogs, and lambs. The marketing, slaughtering, and processing of meat animals.

261. (25.) ANIMAL NUTRITION. Class 3, cr. 3 $24

Must be preceded by Chem. 101-102, or 111-112, or 117-118.

Fundamental principles of animal nutrition.

531. (108.) GENETICS. Class 3, cr. 3 $24

Must be preceded by Pl. Sci. 140 and Zool. 160 or equivalent.

Principles of genetics and their relation to the problems of plant and animal breeding.

Dairy Husbandry

101. (1.) ELEMENTS OF DAIRY PRODUCTION.
Class 2, Lab. 2, cr. 3 $25
Survey of the industry; fundamentals of raising, managing, selecting, and feeding dairy cattle; care of milk and cream on the farm; milk and cream testing; dairy judging.

105. (17.) ELEMENTS OF DAIRY MANUFACTURES.
Class 2, Lab. 2, cr. 3 $25
Methods of manufacturing dairy products; buttermilk, skimmilk, and whey testing; standardization of milk and cream; care and operation of cream separators.

Entomology

100. (1.) INTRODUCTORY ENTOMOLOGY.
Class 2, Lab. 2, cr. 3 $27
The structure, biology, and classification of insects and the principles of insect control.

Forestry

103. (3.) CONSERVATION.
Class 2, cr. 2, or Class 2, Lab. 2, cr. 3 $16 or $25
Development and use of natural resources, with special emphasis on renewable natural resources. Lectures. Directed program of supplemental reading for additional credit.

Horticulture

122. (1.) PLANT PROPAGATION. Class 2, Lab. 2, cr. 2⅔ $25
Principles, with special reference to greenhouse and ornamental plants.

151. (11.) PRINCIPLES OF FRUIT GROWING.
Class 2, Lab. 2, cr. 3 $25
Care and management of small home plantings of tree and small fruits; reclamation of old orchards; control of common fruit pests.

171. (12.) TRUCK CROPS. Class 2, Lab. 2, cr. 3 $25
Intensive production and handling of vegetables for nearby markets, including both outdoor and greenhouse operations.

318. (29.) GENERAL HORTICULTURE. Class 3, cr. 3 $24
Of special interest to students who want one 3-credit course in the various fields of horticulture. Not to be taken by students who have credit in Hort. 151, 171, 207 or 308.

Poultry Husbandry

101. (1.) POULTRY PRODUCTION. Class 2, Lab. 2, cr. 3 $25
The poultry industry in the nation and on the farm. Breeds, breeding, incubation, brooding, feeding, marketing, disease control. Laboratory involving judging, culling, preparation for market, and study of equipment.

School of Aeronautical Engineering and Air Transportation

220. (22.) AIR NAVIGATION. Class 2, cr. 2 $16
Must be preceded by five hours of college mathematics, including trigonometry.
The earth and its coordinates; charts and maps; elementary theory and practice of pilotage and dead reckoning; use of navigational instruments and computers.

225. (31.) AERONAUTICAL METEOROLOGY. Class 2, cr. 2 $16
Must be preceded by five hours of college mathematics or equivalent.
Weather in relation to flight.

School of Chemical and Metallurgical Engineering and Geology

Chemical Engineering

201. (40.) CHEMICAL ENGINEERING CALCULATIONS.
Class 2, Lab. 1, cr. 2⅓ $26
Must be preceded by Chem. 101-102 or equivalent and accompanied or preceded by Math. 241 and Phys. 230.

230. (30.) CHEMISTRY OF ENGINEERING MATERIALS.
Class 3, cr. 3 $24
Available for students of any classification not enrolled in chemical engineering.
Must be preceded by Chem. 101 or equivalent.

528. (128.) CHEMICAL PROCESS INDUSTRIES. Class 3, cr. 3 $24
Must be preceded or accompanied by Chem. 551, 573 and 574.
Applications of unit operations, unit processes, and flow sheets.

529. (129.) CHEMICAL PROCESS INDUSTRIES. Class 3, cr. 3 $24
Continuation of Ch.E. 528.

537. (137.) UNIT OPERATIONS. Class 3, cr. 3 $24
Must be preceded by Ch.E. 201 and preceded or accompanied by Chem. 573.
Quantitative problems in the operation of chemical process equipment, including fluid flow, heat transfer, evaporation, drying, distillation, etc. Special emphasis on design calculations.

538. (138.) UNIT OPERATIONS. Class 3, cr. 3 $24
Must be preceded by Ch.E. 201 and preceded or accompanied by Chem. 574.
Continuation of Ch.E. 537.

Engineering and Economic Geology

201. (3.) PHYSICAL GEOLOGY. Class 2, Lab. 3, cr. 3 $29
Earth forces, processes, and resulting features.

202. (4.) HISTORICAL GEOLOGY. Class 2, Lab. 3, cr. 3 $29
Must be preceded by Geol. 201, 221, 341, or equivalent, with a grade of 4 or better.
Brief synopsis of historical geology, with emphasis on stratigraphic and structural relationships.

Metallurgical Engineering

204. (44.) GENERAL METALLURGY. Class 2, Lab. 3, cr. 3 $30
Must be preceded by Geol. 261 and preceded or accompanied by Phys. 231 and Chem. 227 or equivalent.

310. (110.) NON-FERROUS METALLURGY. Class 3, cr. 3 $24
Must be preceded by Met. E. 204 and Chem. 227, and preceded or accompanied by Chem. 573 or equivalent.

311. (123.) FERROUS METALLURGY. Class 3, cr. 3 $24
Must be preceded by Met. E. 204 and Chem. 227, and preceded or accompanied by Chem. 174 or equivalent.

345. (45.) ELEMENTARY METALLURGY. Class 3, cr. 3 $24
Must be preceded by Chem. 102, Phys. 231 or equivalent.

524. (124. formerly 224.) ADVANCED GENERAL METALLURGY. Class 3, cr. 3 $24
Must be preceded by Met. E. 204, 310 and 311, or equivalent.
Selected topics in refractories, electroplating, roasting, crushing, classification, concentration, etc.

619. (219.) THEORETICAL PHYSICAL METALLURGY. Class 3, cr. 3 $36
Must be preceded by Met. E. 549, 550 and 551 or equivalent.
Newer theories of the metallic state, interpretation of experimental data, recent experimental developments of future significance.

School of Civil Engineering and Engineering Mechanics

Civil Engineering

100. (6.) PLANE SURVEYING. Class 1, Lab. 3, cr. 2 $25

262. (17.) RAILROADS. Class 1, Lab. 3, cr. 2 $25
Must be preceded by CE. 104.
Maintenance; problems in frogs, switches, yards, transition spiral; quantities, cost data, monthly and final estimates.

268. (61.) HIGHWAY CONSTRUCTION. Class 1, Lab. 3, cr. 2 $22
Must be preceded by CE. 104.
Location, earthwork, drainage, design, contract procedure, and maintenance. Particular emphasis on low-cost roads.

269. (62.) HIGHWAY CONSTRUCTION. Class 2, cr. 2 $16
Must be preceded by E.M. 312.
Materials, design, construction, and maintenance of bituminous concrete and block types of roads and streets; subgrade stabilization; administration and finance; comparative values of road-surface types.

341. (41.) HYDRAULICS. Class 3, cr. 3 $24
Must be preceded by E.M. 204.
Pressure on submerged surfaces; flow of fluids, dynamics of flow; models.

370. (21.) STRESSES. Class 4, Lab. 4, cr. 5⅓ $51
Must be preceded by E.M. 204.
Analysis of statically determinate structures; reactions, shears, bending moments, and direct stresses due to fixed and moving loads; beams and framed structures.

371. (71.) INDETERMINATE STRESSES. Class 3, cr. 3 $24
Must be preceded by C.E. 370 and E.M. 313.
A thorough drill in computing deflection of beams; indeterminate analysis by moment areas, consistent deflections, slope deflection, and moment distribution.

373. (23.) FUNDAMENTALS OF STRUCTURAL DESIGN. Class 2, Lab. 3, cr 3 $30
Must be preceded by E.M. 204 and 313.
Proportioning and disposition of structural elements in simple structures.

502. (102.) LAND SURVEYING. Class 2, cr. 2 $16
Must be preceded by C.E. 102.
United States government survey of public lands. Laws of land surveying. Plats, descriptions, area computations. County planning, zoning, highways.

506. (165.) CITY PLANNING. Class 2, cr. 2 $16
Principles of planning; street systems, transportation, recreational facilities, housing, landscape engineering.

528. (168.) MUNICIPAL ENGINEERING. Class 2, cr. 2 $16
Must be preceded or accompanied by C.E. 459.
Engineering and legal problems of the city engineer, city government, city surveys, subdivision design, building codes, legal procedures for making public improvements.

Engineering Mechanics

204. (21.) STATICS AND KINETICS. Class 5, cr. 5 $40
Must be preceded by Phys. 230 and preceded or accompanied by Math. 242.
Statics; forces, vectors, moments, equilibrium, friction, centers of gravity and moments of inertia.
Kinetics: force, mass, acceleration, velocity, inertia, work, energy, power, impulse and momentum.

312. (22.) MECHANICS OF MATERIALS. Class 4, cr. 4 $32
Must be preceded by E.M. 204 and Math. 242.
Stress and strain; properties of materials; riveted and welded joints; torsion; shear and moment; bending and deflection of beams; statically indeterminate beams; combined stresses; columns.

402. (32.) DYNAMICS. Class 3, cr. 3 $24
Must be preceded by E.M. 312.
Relative motions; accelerations; velocities, and displacements for compound motions; Coriolis' Law; centrifugal and inertia effects; critical speeds; impulse and momentum; gyroscopic effects.

421. (31.) STRENGTH OF MATERIALS. Class 3, cr. 3 $24
Must be preceded by E.M. 312 or 313 and C.E. 331 or 335 or Met. 549.
Strength of materials as such; true stress-true strain relations; elastic strength; flow strength; fracture strength; the effects of state of stress, temperature, speed of loading, cycles of loading, duration of load and previous history of the materials.

531. (111.) ENGINEERING MATERIALS. Class 2, Lab. 6, cr. 4 $45
Must be preceded by E.M. 312.
Actions of materials under load; verification of theories of mechanics; techniques for determining properties of materials A term paper is required.

562. (112.) BASIC VIBRATIONS. Class 3, cr. 3 $24
Must be preceded by E.M. 312 and Math. 421.
Principles of harmonic motion; free and forced vibrations with one, two, and many degrees of freedom; damped vibration (velocity damping) with various degrees of freedom; other forms of damping; approximation of complex systems by such methods as Rayleigh's, Holzer's, etc.

School of Electrical Engineering

342. (42.) ELECTRIC CIRCUIT THEORY. Class 3, cr. 3 $24
Must be preceded by E.E. 303.
Engineering extension course for credit. Basic electric theory, network theorems.

534. (134.) POWER TRANSMISSION AND DISTRIBUTION I. Class 3, cr. 3 $24
Must be preceded or accompanied by E.E. 316 or 405.
Methods and materials used in design and construction of overhead power lines.

550. (150.) ADVANCED ELECTRONICS. Class 3, cr. 3 $24
Engineering extension course on electronic theory and tube design.

561. (161.) ILLUMINATING ENGINEERING. Class 3, cr. 3 $24
Must be preceded by E.E. 303.
Lamp characteristics, illumination measurements and calculations, lighting applications and costs.

578. (188.) SYMMETRICAL COMPONENTS. Class 3, cr. 3 $24
Must be preceded by E.E. 304.
Theory and applications; solutions of unbalanced circuits.

583. (183.) AUTOMATIC CONTROL MECHANISMS. Class 3, cr. 3 $24
Must be preceded by E.E. 307 and 316 or 405.
Fundamental physical and mathematical principles of servo and other automatic control components.

Department of General Engineering

121. (11.) ENGINEERING DRAWING. Class 1, Lab. 4, cr. 2 $28
Solutions of problems applied to engineering conditions. Emphasis is placed upon use of drafting tools, lettering, orthographic projection, isometric drawing, and drawings made for reproduction purposes. Problems are designed to require practical reasoning.

A student transferring from another college or university may be granted credit for previous engineering drawing.

A student who has had two years of high school drawing or equivalent industrial drafting experience may be given credit for GE 11, on the basis of an examination given at the time of the regular orientation examinations.

A student may qualify for credit in GE 12 by submitting acceptable samples of his drafting work done in industry accompanied by a letter from his employer, indicating the nature and duration of his service.

Credentials for advanced standing must be submitted in advance of registration.

122. (12.) ENGINEERING DRAWING. Class 1, Lab. 4, cr. 2 $28
Continuation of G.E. 121. Developments and intersections, dimensioning, shop notes, and conventional practices, fasteners, and assembly and detail working drawing.

222. (16.) DESCRIPTIVE GEOMETRY. Class 1, Lab. 3, cr. 2 $23
Must be preceded by G.E. 122 and Math. 142 or 112.
Relations of points, lines, and planes and their graphical and algebraic representations; graphical solutions, and associations with algebraic solutions of theoretical and practical problems.

292. (93.) ELEMENTS OF ACCOUNTING I. Class 3, cr. 3 $24
Basic principles of accounting for assets, liabilities and net worth. Financial transactions analyzed in terms of their significance in the preparation and interpretation of financial statements. (Credit in this course may be substituted for G.E. 370 upon passing an examination on the campus.)

All engineering students take at least two courses in drafting.

An instructor explains the meaning of some statistical quality control data.

293. (94.) ELEMENTS OF ACCOUNTING II. Class 3, cr. 3 $24

Must be preceded by G.E. 370 or 292.

Continuation of basic accounting principles, including special features of accounting for partnerships, corporation capital stock and surplus, funds and reserves, cash and stock dividends, methods of internal check, consignments, and analysis of comparative financial statements. (Credit in this course may be substituted for G.E. 371 upon passing an examination on the campus.)

316. (21.) PRODUCTION ILLUSTRATION.

Lab. 6, or Class 1, Lab 6, cr. 2 or 3 $29 or $37

Must be preceded by G.E. 222.

Perspective, detail, sectioned, phantom, and exploded assembly drawings; light and shade, dimensioning, and techniques, all as applied to catalog and production illustration.

363. (89.) INDUSTRIAL SAFETY. Class 3, cr. 3 $24

Must be preceded by G.E. 345, 275, 176.

Safety methods in industry. Safety codes, compensation, inspection, safety educational program, industrial facilities to care for injured workmen, health hazards and protective measures, safeguards on equipment and buildings to prevent accidents.

365. (98.) INDUSTRIAL ORGANIZATION AND MANAGEMENT.

Class 3, cr. 3 $24

Students must have at least junior standing.

Basic course in principles of organization and management. Introduces the functions of plant layout, production planning and control, quality control, motion and time study, industrial relations, accounting and sales.

569. (152.) SALES ENGINEERING. Class 3, cr. 3 $24

Students must have at least junior standing in Engineering.

The principles and problems of sales management; market and sales planning, sales programs and promotion, sales organization and management, distribution, prices, terms, and control of sales. The relation and application of engineering to sales of technical products.

570. (127.) COST ACCOUNTING. Class 3, cr. 3 $24

Must be preceded by G.E. 370.

Procedures for achieving cost control of materials, labor and burden; methods of finding the cost of specific orders or lots; fundamentals of process costs; survey of standard costs; preparation, interpretation and utilization of cost reports.

575. (128.) MOTION AND TIME STUDY. Class 3, cr. 3 $24

Students must have at least junior standing. Not available for graduate credit toward advanced degrees in Industrial Engineering and Management.

Techniques of motion and time study and their interrelationship. Basic procedure, process analysis, operation analysis, multiple-activity analysis, micro and memo-motion analysis and stop-watch time study.

576. (129.) ADVANCED MOTION AND TIME STUDY.

Class 3, cr. 3 $29

Must be preceded by G.E. 575.

Formulation of industrial policies for the application of motion and time study. Practice in construction of standard times and synthetic rates. Micromotion technique applied to industrial problems.

578. (183.) PROCESS DESIGN. Class 3, cr. 3 $24

Must be preceded by G.E. 345, 161, 365, 575, not available for graduate credit toward advanced degrees in Industrial Engineering and Management.

Analysis and synthesis of basic production processes for foundry, metal working, wood working and other industries. Economic aspects of manufacturing procedures.

579. (185.) PRODUCTION CONTROL. Class 3, cr. 3 $24
Must be preceded by G.E. 578.
The basic concepts, principles, objectives, influencing factors, and functions of quantitative control in industrial organizations of both manufacturing and service types; to include an introduction to quality control.

581. (184.) TOOL DESIGN. Class 3, cr. 3 $24
Must be preceded by G.E. 578 and M.E. 470 or 371.
Fundamental principles of tool design with specific reference to the design of tools for the basic manufacturing processes.

583. (186.) PLANT LAYOUT. Class 2, Lab. 4, cr. 3 $36
Must be preceded by G.E. 570 and 579.
Design of a complete manufacturing plant.

585. (117.) INDUSTRIAL RELATIONS Class 3, cr. 3 $24
Must be preceded by G.E. 365.
Personnel management functions of job analysis, selection and placement, training, wage and hour administration, and employee services; introduction to collective bargaining.

586. (118.) LABOR RELATIONS. Class 3, cr. 3 $24
Must be preceded by 585.
Human, economic, legal and engineering aspects of labor relations and collective bargaining.

587. (195.) WAGE ADMINISTRATION. Class 3, cr. 3 $24
Must be preceded by G.E. 585 and 575 or equivalent.
Job analysis, job evaluation, merit rating and wage payment plans.

School of Mechanical Engineering

230. (29.) ELEMENTARY HEAT POWER. Class 3, cr. 3 $24
Must be preceded by Phys. 220 or 240 and Math. 241.
Fuels and combustion, internal combustion engines, steam generation, turbines, heat exchangers, fans and pumps.

300. (40.) THERMODYNAMICS. Class 3, cr. 3 $24
Must be preceded by M.E. 230, Math. 242 and M.E. 280.
First law; properties of liquids and gases; energy effects for gas and vapor changes; second law; entropy; flow of fluids.

301. (41.) THERMODYNAMICS. Class 3, cr. 3 $24
Continuation of M.E. 300. Gas-vapor mixtures, combustion, gas and vapor cycles, compressors, refrigeration, heat transfer.

360. (11.) MECHANISM. Class 2, Lab. 3, cr. 3 $30
Must be preceded by E.M. 204 and M.E. 280.
Motions and velocities of machine parts.

366. (65.) DYNAMICS OF MACHINERY. Class 2, Lab. 3, cr. 3 $30
Must be preceded by M.E. 360 and E.M. 204.
Velocities, accelerations, working and inertia forces in machine parts.

470. (66.) MACHINE DESIGN. Class 3, Lab. 6, cr. 5 $53
Must be preceded by M.E. 366 and E.M. 312.
Proportioning of machine parts according to the laws of mechanics, with attention to function, production, and economic factors; design of a machine.

500. (136.) THERMODYNAMICS. Class 3, cr. 3 $24
Must be preceded by M.E. 301.
A more extended treatment of the fundamentals of thermodynamics, including equilibrium, combustion, and real gases.

510. (106.) FLUID DYNAMICS AND MACHINERY. Class 3, cr. 3 $24
Must be preceded by M.E. 310.
Steady and unsteady flow of compressible and incompressible fluids; principles of operation of fluid dynamical machines such as centrifugal and axial-flow fans, pumps, compressors, fluid couplings, and torque converters

School of Home Economics

Applied Design

101. (51.) SURVEY OF THE ARTS. Class 3, cr. 3 $24
An introductory study of the visual arts in relation to problems of today.

101L. (51L.) DESIGN. Lab. 2, cr. 1 $10
Laboratory problems in the basic elements of design.

355. (55.) ART APPRECIATION. Class 3, cr. 3 $24

Clothing and Textiles

102. (2.) CLOTHING THE INDIVIDUAL. Class 3, cr. 3 $24
Must be preceded or accompanied by A.D. 101 and 101L and C.&T. 102L.
Selection and care of clothing and textiles.

102L. (2L.) CLOTHING CONSTRUCTION. Lab. 2, cr. 1 $10
Must be preceded or accompanied by C.&T. 102 and A.D. 101 and 101L.
Laboratory work in garment construction and repair.

227. (27.) WARDROBE PLANNING. Class 2, cr. 2 $16
Fundamentals of costume selection and clothing budgets.

Family Life

209. (9.) FAMILY HEALTH.
Class 2, Lab. 1, cr. 2 (Lab. for 5 weeks only) $17
Lectures and demonstrations on the fundamental principles of nursing in the home, disease prevention, and maternal and infant care.

350. (71.) MARRIAGE AND FAMILY RELATIONSHIPS.
Class 3, cr. 3 $24
Designed to provide further understanding of family relationships for those unmarried, those contemplating marriage, those married, and prospective counselors of all of them. A functional approach to the interpersonal relationships of courtship, marriage, and family life. Open to both men and women.

530. (130.) SPECIAL PROBLEMS. cr. 1 to 4 $8 per credit hour
Must be preceded by F.L. 410 and 520 or equivalent.
Special subjects for investigation and experiment according to the individual student's interest and need.

Foods and Nutrition

101. (1.) FOOD SELECTION. Class 2, cr. 2 $16
Selection of foods to make an adequate diet.

213. (13.) FAMILY FOOD PURCHASING. Class 2, Lab. 3, cr. 3 $30
Must be preceded by F.N. 202.
Varieties, standards, grades, brands, qualities of food products factors governing costs; food legislation.

A specialist discusses home flower culture in an evening adult class.

Home Management

226. (6.) HOUSING THE FAMILY. Class 3, cr. 3 $24
Must be preceded by A. D. 101 and 101L.
Planning and choice of homes and furnishings for modern living.

303. (3.) OPERATING THE HOUSEHOLD. Class 3, cr. 3 $24
For students not majoring in home economics.
Elements of marketing and budgeting; choice and care of equipment and other furnishings; laundry and cleaning methods; motion and time saving at daily tasks; food management.

Institution Management

440. (139.) INSTITUTION FOOD PURCHASING
Class 2, Lab. 2, cr. 3 $25
Must be preceded by I.M. 338 and 338L or I.M. 335.
Methods of buying, bases of selection and storage of food.

536. (136.) SCHOOL LUNCHROOM MANAGEMENT. cr. 3 $24
For graduates in Home Economics who are managing lunchrooms and who have had courses in foods and nutrition approved by the Department.
Survey of school lunchroom problems; menu planning, purchase, preparation, and service of food; records; management; equipment.

School of Pharmacy

Pre-Pharmacy Year. Students who expect to complete work for a degree in the School of Pharmacy should take a year of pre-pharmacy courses (School of Science, Pre-Pharmacy Option) followed by a three-year program of professional courses in the School of Pharmacy.

Students taking the pre-pharmacy year in colleges other than the School of Science, Purdue University, should submit 30 or more semester hours of credit, including the following:

General Inorganic Chemistry	6 hours
Mathematics (Algebra and Trigonometry)	6 hours
English Composition	3 hours
Speech or Rhetoric	3 hours
Botany	4 hours
Zoology	4 hours
Approved Electives	4 or 6 hours
Total	30 to 32 hours

Approved electives include:

Modern Language	6 hours
Principles of Economics	3 or 6 hours
Introductory Sociology	3 hours
Elementary Psychology	3 hours
Engineering Drawing	2 or 4 hours
American Government	3 or 6 hours
Mathematics (Analytic Geometry and Calculus)	6 hours
English Literature or Expository Writing	3 hours

If an applicant has the required number of hours of academic credit but does not have credit for all prescribed subjects, he may be admitted with eight semester hours of deficiency, which must be made up before graduation.

The attention of applicants is directed to the following admission and residence provisions:

1. Students who have completed the pre-pharmacy year at Purdue or elsewhere cannot be assured of admission to the School of Pharmacy. When the number of qualified applicants exceeds the available facilities, preference will be given to residents of Indiana, and selection of students will be made on the basis of qualifications as determined from the transcript of record, examinations, and personal interviews.

2. Students will enter the professional program of study in the School of Pharmacy only at the beginning of the fall semester of each academic year. Application for admission should be made on or before April 1 preceding the planned entrance date.

3. Three years' residence in an accredited school or college of pharmacy is required for qualification for the degree of Bachelor of Science in Pharmacy.

School of Science

BIOLOGICAL SCIENCES

Biology

101. (Bio. 1.) GENERAL BIOLOGY. Class 2, Lab. 2, cr. 3 $28
Fundamental facts underlying the biological sciences; study of a series of type forms with emphasis on laboratory exercises.

102. (Bio. 2.) GENERAL BIOLOGY. Class 2, Lab. 2, cr. 3 $28
Continuation of Biol. 101.

108. (Bio. 8) CULTURAL BIOLOGY. Class 3, cr. 3 $24
Continuation of Biol. 107. Nature, organization and diversity of living organisms. Nutrition, reproduction, genetics, and evolution. Special emphasis on the significance of biology to problems of modern life and its integration with other studies of man's activities. Either Biol. 108 or Psy. 120 may be used to satisfy a requirement of the School of Science.

110. (Bio. 15.) APPLIED INDUSTRIAL MICROBIOLOGY.
Class 2, cr. 2, or Class 2, Lab. 2, cr. 3 $16 or $28
(Offered only through the Division of Technical Extension)
Applications of microorganisms to industry and their relations to infection and immunity, public health, microbiological assay of foods, and preparation of antibiotics.

Bacteriology

211.* (Bio. 18.) BACTERIOLOGY. Class 2, Lab. 4, cr. 4 $40
Must be preceded by Biol. 101, or PLSC 140 or 142 or Pharm. 362 and Chem. 112, except for juniors in Civil Engineering.
General Bacteriology: methods of detection, isolation, and identification.

511. (Bio. 121.) MEDICAL MICROBIOLOGY. Class 2, Lab. 4, cr. 4 $40
Must be preceded by Bact. 212.
Study of the bacteria and viruses associated with infectious diseases and consideration of the principles of immunology and serology.

Plant Science

140. (Bio. 6.) INTRODUCTION TO PLANT LIFE.
Class 3, Lab. 3, cr. 4 $43
Fundamental principles of the structure and function of the higher plants; representative members of each plant group.

Zoology

160. (Bio. 5.) BIOLOGY OF ANIMALS. Class 3, Lab. 3, cr. 4 $43
Basic biological principles of animals.

162. (Bio. 31.) COMPARATIVE ANATOMY OF VERTEBRATES.
Class 2, Lab. 6, cr. 4 $51
Must be preceded by Zool. 161 or equivalent.
Comparison of the structure of vertebrate animals; dissection of examples of the principal types.

262. ANATOMY AND PHYSIOLOGY Class 4, Lab. 3, cr. 5 $51
(Offered only in the Nurses' Training Program.)
Lectures, recitations and laboratory work in basic anatomy and physiology.

370. (Bio. 39a.) PHYSIOLOGY. Class 3, cr. 3 $24
Must be preceded by Biol. 101-102 or Zool. 160.
Physiology of tissues in general, muscle, nerve, brain and sense organs.

371. (Bio. 39b.) PHYSIOLOGY. Class 3, cr. 3 $24
Must be preceded by Biol. 101-102 or Zool. 160.
Physiology of circulation, respiration, digestion, excretion and endocrine glands.

CHEMISTRY

101. (1.) GENERAL CHEMISTRY. Class 3, Lab. 3, cr. 4 $43
Laws and principles of chemistry, with special emphasis on topics of importance in engineering. Numerical problems and relationships are introduced whenever quantitative treatment is possible.

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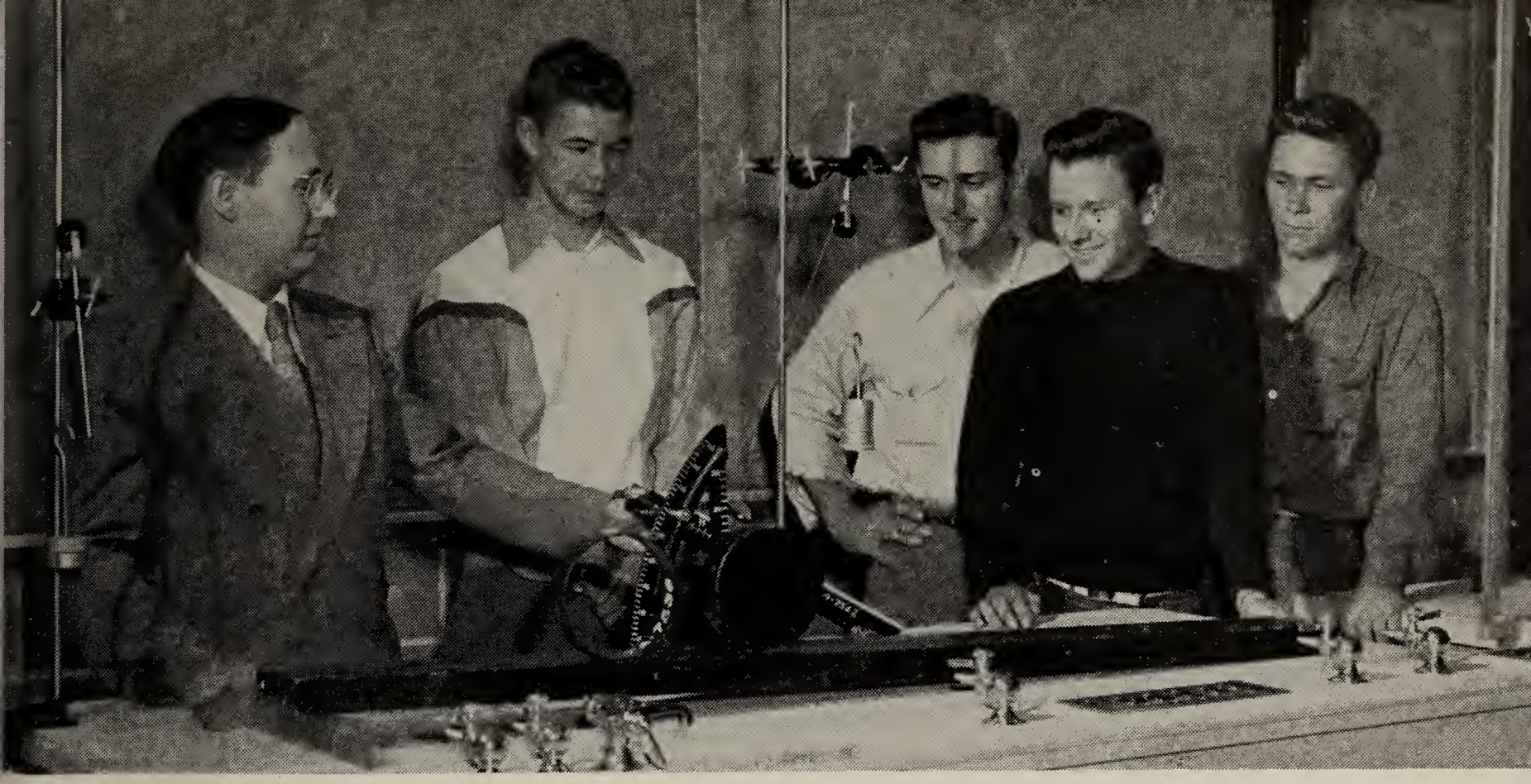
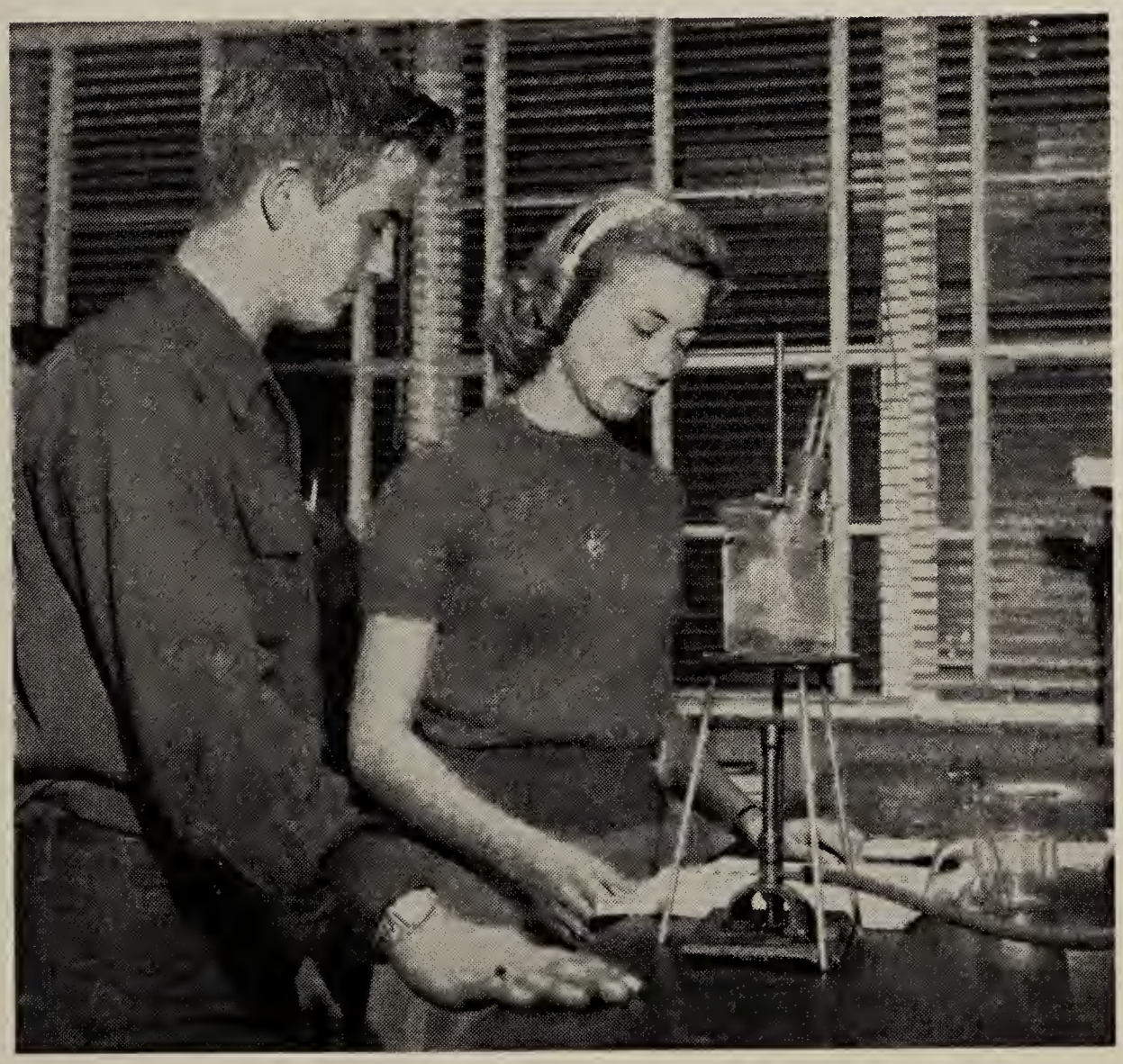
* May be offered as a two-credit recitation course with special approval.



Laboratory facilities and equipment at the Purdue Centers compare favorably with those provided on the Lafayette campus.



102. (2.) GENERAL CHEMISTRY. Class 3, Lab. 3, cr. 4 $43
Required of all engineering students who do not take Chem. 118.
Continuation of Chem. 101.

111. (11.) GENERAL CHEMISTRY. Class 2, Lab. 3, cr. 3 $35
Required for all freshman registered in the School of Agriculture, or in pre-pharmacy or biology options of the School of Science, who are not in Chem. 101 or 117.

112. (12.) GENERAL CHEMISTRY. Class 2, Lab. 3, cr. 3 $35
Continuation of Chem. 111.

226. (26.) QUALITATIVE ANALYSIS. Class 2, Lab. 6, cr. 4 $53
Must be preceded by Chem. 102 or 118.
Semimicro qualitative analysis for cations and anions.

227. (27.) INTRODUCTORY QUANTITATIVE ANALYSIS. Class 2, Lab. 6, cr. 4 $53
Must be preceded by Chem. 226.
Introduction to quantitative methods.

255. (55.) ORGANIC CHEMISTRY. Class 3, cr. 3 $24
Must be preceded by Chem. 102, 108, 112 or 118.

255L. ORGANIC CHEMISTRY LABORATORY. Lab. 3, cr. 1 $19
Laboratory experiments to accompany Chem. 255.

256. (56.) ORGANIC CHEMISTRY. Class 3, cr. 3 $24
Continuation of Chem. 255.

256L. ORGANIC CHEMISTRY LABORATORY. Lab. 3, cr. 1 $19
Laboratory experiments to accompany Chem. 256.

English

1. (A.) ENGLISH COMPOSITION. Class 3, cr. 0 $24
For students who fail to pass the orientation examination in English.
Prepares students for English 101 through directed practice in writing and a review of fundamentals of grammar, spelling, and punctuation.
Students who receive grades of C or better in English 1 will be given credit for English 101.

101. (1.) ENGLISH COMPOSITION. Class 3, cr. 3 $24
Prerequisite to all courses in English except Engl. 1, 2, 3, 103 and 185.
Purpose: to develop competence in written expression through directed practice in writing. Background aids are assignments in organization, paragraph development, sentence effectiveness, grammar, punctuation, spelling, diction and usage, critical reading and use of the library.

103. (32.) ENGLISH COMPOSITION. Class 3, cr. 3 $24
A composition course for freshmen provisionally excused from English 101 on the basis of orientation tests. The course attempts to develop writing on a high critical level, improve reading tastes, and arouse an interest in the humanities and conflicting intellectual attitudes.
Students who receive grade C or better will be excused from Engl. 202 and given credit for Eng. 101; those who receive grade D must take Engl. 101 or 202, depending upon the recommendation of the Engl. 103 instructor; those who fail to pass Engl. 103 must take both Engl. 101 and 202.

185. (X.) DEVELOPMENTAL READING. Lab. 2, cr. 2/3 $30
Purpose: to increase reading efficiency by improving comprehension and by developing the motor skills involved in reading speed. Motivates reading interest through use of films, slides, and accelerators.
Required of all students in the School of Science.

202. (31.) EXPOSITORY WRITING. Class 3, cr. 3 $24

A second course in English composition, supplementary to the training offered in the prerequisite course, Engl. 101.

A student who has received a grade of A or B in Engl. 101 may, with the approval of the head of the Department of English, substitute for Engl. 202 an advanced course in English.

235. (19.) INTRODUCTION TO THE DRAMA. Class 3, cr. 3 $24

Drama as literature and as theatre art. Forms, techniques, and subject matter of the drama as illustrated by about twenty-five plays, most of them modern.

238. (27.) INTRODUCTION TO FICTION. Class 3, cr. 3 $24

Reading and discussion of selected short stories and seven novels, to promote awareness, understanding, and appreciation of the range, values, techniques, and meanings of reputable modern fiction.

240. (5.) A SURVEY OF ENGLISH LITERATURE TO GRAY. Class 3, cr. 3 $24

Surveys English literature to the end of the neo-classical period, considering not only historical and social backgrounds but especially literary form and the thought of selected writers.

Required of all students majoring in Literature.

405. (137.) ADVANCED ENGLISH COMPOSITION. Class 3, cr. 3 $24

Informally conducted for students who enjoy writing—of any kind except the narrowly technical—and concerned with problems of form, style, diction, sentence structure. Workshop criticism. May be repeated for credit.

420. (121.) BUSINESS WRITING: GENERAL APPLICATIONS. Class 3, cr. 3 $24

Application of business writing principles to the preparation of common letter types, reports, and advertising copy. Sales, adjustment, collection, and employment letters are stressed.

576. (111.) MODERN DRAMA: THE PLAYS OF IBSEN AND BERNARD SHAW. Class 3, cr. 3 $24

A course dealing with the two greatest dramatists of the past century. Plays of Ibsen and Shaw are examined thoroughly for both ideas and technique.

577. (132.) MODERN ENGLISH AND AMERICAN POETRY. Class 3, cr. 3 $24

Surveys modern poetry from Hardy to Auden; relates it to the main currents of contemporary thought and feeling; introduces elementary critical principles.

History

205. (5.) THE UNITED STATES AND ITS PLACE IN WORLD AFFAIRS. Class 3, cr. 3 $24

History of the United States since 1914, and its participation in world affairs.

300. (106.) AMERICAN HISTORY TO 1865. Class 3, cr. 3 $24

301. (107.) AMERICAN HISTORY FROM 1865 TO THE PRESENT TIME. Class 3, cr. 3 $24

410. (2.) EUROPEAN HISTORY, 1815-1914. Class 3, cr. 3 $24

415. (3.) EUROPE SINCE 1914. Class 3, cr. 3 $24

Credit will not be given for both Hist. 210 and 415.

Economics

210. (1.) PRINCIPLES OF ECONOMICS. Class 3, cr. 3 $24

Credit will not be given for both Econ. 210 and 211.

211. (11.) PRINCIPLES OF ECONOMICS. Class 3, cr. 3 $24
Credit will not be given for both Econ. 210 and 211.

212. (12.) PRINCIPLES OF ECONOMICS. Class 3, cr. 3 $24
Must be preceded by Econ. 211.

382. (130.) ECONOMIC GEOGRAPHY. Class 3, cr. 3 $24
Geographic factors determining production and industry in the principal regions of the world.

450. (121.) LABOR ECONOMICS. Class 3, cr. 3 $24
Must be preceded by Econ. 210, 211 or 310.

470. (125.) BUSINESS LAW. Class 3, cr. 3 $24
Must be preceded by Econ. 210, 211 or 310.
Introduction to American business law, covering persons, torts, contracts, and agency.

553. (124.) LABOR LAW. Class 3, cr. 3 $24
Prerequisite: Econ. 450 or consent of instructor.
Court decisions in respect to labor.

Government

101. (1.) INTRODUCTION TO GOVERNMENT. Class 3, cr. 3 $24
The problems of government as illustrated by American national government. Attention to political theory as well as to the organization and problems of government.

102. (2.) INTRODUCTION TO GOVERNMENT. Class 3, cr. 3 $24
Must be preceded by Govt. 101.
State and local government—powers, relationships, and problems of administration with emphasis on the middle western states.

301. (30.) ELEMENTS OF DEMOCRACY. Class 3, cr. 3 $24
Not open to students who have had Govt. 101.
Fundamental problems all governments must face, and how they are met in a democracy as contrasted with other types of society.

331. (109.) INTERNATIONAL RELATIONS. Class 3, cr. 3 $24
Introductory survey of the underlying forces in international relations, the foreign policies of the great powers, and agencies of control and cooperation.

532. (110.) CONTEMPORARY INTERNATIONAL PROBLEMS.
Class 3, cr. 3 $24
Current international issues and developments in international cooperation and world order.

Mathematics

NOTE: Students enrolled in Engineering, in the School of Science in Chemistry, Mathematics, or Physics, and in the School of Agriculture in Agricultural Chemistry or Science programs should take Math. 141, 142, 241, 242. Certain schools also require Math. 421. Math. 115, 112 and 116 may be substituted for Math. 141 and 142. Students in programs listed above who have inadequate preparation take Math. 131, 132, 241, 242. Math. 111 and 112 may be substituted for Math. 141 or vice versa depending on courses available. Programs in Agriculture which require Math. 101 may substitute Math. 121; those requiring Math. 111 and 112 may substitute Math. 141 or, except for Forestry program, Math. 121 and 122.

3. (C.) SOLID GEOMETRY. Class 2, cr. 0 $16
Credit, one-half unit for admission.
For engineering students with an entrance deficiency in this subject.

111. (12.) ALGEBRA. Class 3, cr. 3 $24

112. (11.) TRIGONOMETRY. Class 3, cr. 3 $24
Should be preceded by Math. 111.

115. (15). ALGEBRA. Class 4, cr. 4 $32
This covers all the algebra of Math. 141 and 142.

116. (16.) ANALYTIC GEOMETRY. Class 4, cr. 4 $32
This covers the analytic geometry of Math. 142.

121. (21.) GENERAL COLLEGE MATHEMATICS I. Class 3, cr. 3 $24
With Math. 122 satisfies the core requirements for Mathematics in the School of Science.

122. (22.) GENERAL COLLEGE MATHEMATICS II. Class 3, cr. 3 $24
Continuation of Math. 121.

131. (31.) ELEMENTARY ENGINEERING MATHEMATICS.
Class 6, cr. 5 $40
For students with inadequate preparation for Math. 141.

132. (32.) ELEMENTARY ENGINEERING MATHEMATICS.
Class 6, cr. 5 $40
Continuation of Math. 131.

141. (1.) ALGEBRA AND TRIGONOMETRY. Class 5, cr. 5 $40
Required for engineering students and science students who major in mathematics, physics, or chemistry. Students with inadequate preparation will be assigned to Math. 131.

142. (2.) ANALYTIC GEOMETRY. Class 5, cr. 5 $40
Must be preceded by Math. 111 and 112 or 141.

241. (3.) CALCULUS I. Class 4, cr. 4 $32
Must be preceded by Math. 132 or 142.

242. (4.) CALCULUS II. Class 4, cr. 4 $32
Must be preceded by Math. 241.

351. (51.) ELEMENTARY STATISTICS. Class 3, cr. 3 $24
Must be preceded by Math. 111 and 112 or 121 and 122 or equivalent.
Emphasis on practical applications to all fields; machine calculations and interpretation of data.

352. (52.) ELEMENTARY STATISTICS. Class 3, cr. 3 $24
Continuation of Math. 351.

413. (118.) MATHEMATICS OF FINANCE. Class 3, cr. 3 $24
Simple and compound interest; applications to annuities, sinking funds, amortization, depreciation, bonds; elementary mathematical theory of life annuities and life insurance.

421. (107.) DIFFERENTIAL EQUATIONS AND APPLICATIONS.
Class 3, cr. 3 $24
Must be preceded by Math. 242.
Derivations and solutions of differential equations for problems in physics, chemistry, and engineering.

460. (185.) COLLEGE GEOMETRY. Class 3, cr. 3 $24
For students working toward a secondary school license in Mathematics. Synthetic methods applied to: special points and circles of the triangle, coaxial circles, similarity, inversion, poles and polars, cross ratio.

521. (105.) ADVANCED ENGINEERING MATHEMATICS I.
Class 3, cr. 3 $24
Must be preceded by Math. 421.
Elliptic integrals, power series, Fourier series; hyperbolic, gamma, and Bessel functions. Emphasis on applications.

522. (106.) ADVANCED ENGINEERING MATHEMATICS II.
Class 3, cr. 3 $24

Must be preceded by Math. 521.

Continuation of Math. 521. Vector analysis, partial derivatives, partial differential equations, function of a complex variable, Laplace transforms.

531. (127.) ADVANCED CALCULUS I. Class 3, cr. 3 $24

This course is a prerequisite for many of the advanced courses.

Limits, continuity and differentiation of functions of one and several variables; the Riemann integral; multiple, line, and surface integrals

532. (128.) ADVANCED CALCULUS II. Class 3, cr. 3 $24

The real number system, infinite series, power series, Fourier series, improper integrals, gamma function, implicit functions, Jacobians. Emphasis on rigorous proof.

557. (155.) STATISTICAL METHODS IN ENGINEERING I.
Class 3, cr. 3 $24

Must be preceded by Math. 242.

Frequency distribution, control charts for measurements and attributes, simple probability, acceptance sampling, linear correlation and applications.

Modern Language

French

101. (MLs 21.) FIRST COURSE IN FRENCH. Class 2, Lab. 2, cr. 3 $25

For beginners only

Unless recommended by the head of the school in which the student is registered, a student may not apply toward graduation the credit for French 101 without satisfactorily completing a more advanced course in French.

102. (MLs 22.) SECOND COURSE IN FRENCH. Class 2, Lab. 2, cr. 3 $25

Must be preceded by French 101 or equivalent.

Continuation of French 101.

German

101. (MLs 41.) FIRST COURSE IN STANDARD GERMAN.
Class 2, Lab. 2, cr. 3 $25

For beginners only.

Unless recommended by the head of the school in which the student is registered, a student may not apply toward graduation the credit for German 101 without satisfactorily completing a more advanced course in German.

102. (MLs 42.) SECOND COURSE IN STANDARD GERMAN.
Class 2, Lab. 2, cr. 3 $25

Must be preceded by German 101 or equivalent.

Continuation of German 101.

151. (MLs 51.) FIRST COURSE IN CHEMICAL GERMAN.
Class 3, cr. 3 $25

For students in chemical engineering only.

Credit will not be given for both German 101 and 151.

Unless recommended by the head of the school in which the student is registered, a student may not apply toward graduation the credit for German 151 without satisfactorily completing a more advanced course in German.

152. (MLs 52.) SECOND COURSE IN CHEMICAL GERMAN.
Class 3, cr. 3 $25

For students in chemical engineering only.

Must be preceded by German 151 or equivalent.

Continuation of German 151.

243. (MLs 45.) THIRD COURSE IN SCIENTIFIC GERMAN.
Class 3, cr. 3 $25

Must be preceded by German 102 or equivalent.

244. (MLs 46.) FOURTH COURSE IN SCIENTIFIC GERMAN.
Class 3, cr. 3 $25

Must be preceded by German 243 or equivalent.
Continuation of German 243.

Russian

101. (MLs 91.) FIRST COURSE IN STANDARD RUSSIAN.
Class 2, Lab. 2, cr. 3 $25

For beginners only.
Unless recommended by the head of the school in which the student is registered, a student may not apply toward graduation the credit for Russion 101 without satisfactorily completing a more advanced course in Russian.

102. (MLs 92.) SECOND COURSE IN STANDARD RUSSIAN.
Class 2, Lab. 2, cr. 3 $25

Must be preceded by Russian 101 or equivalent.
Continuation of Russion 101.

Spanish

101. (MLs 61.) FIRST COURSE IN SPANISH. Class 2, Lab. 2, cr. 3 $25

For beginners only.
Unless recommended by the head of the school in which the student is registered, a student may not apply toward graduation the credit for Spanish 101 without satisfactorily completing a more advanced course in Spanish.

102. (MLs 62.) SECOND COURSE IN SPANISH.
Class 2, Lab. 2, cr. 3 $25

Must be preceded by Spanish 101 or equivalent.

Physics

100. (1d.) OUTLINE OF PHYSICS FOR NURSES.
Class 4, Lab. 3, cr. 5 $50

General Physics with emphasis on applications to medicine.

220. (34.) GENERAL PHYSICS. Class 3, Lab. 3, cr. 4 $42

Must be preceded by Math. 111 and 112 or by Math. 101.
Mechanics, heat, and sound, for students not specializing in physics.

221. (35.) GENERAL PHYSICS. Class 3, Lab. 3, cr. 4 $42

Must be preceded by Phys. 220.
Electricity, light, and modern physics, for students not specializing in physics.

230. (1.) GENERAL PHYSICS. Class 4, Lect. Dem. 1, cr. 4⅓ $39

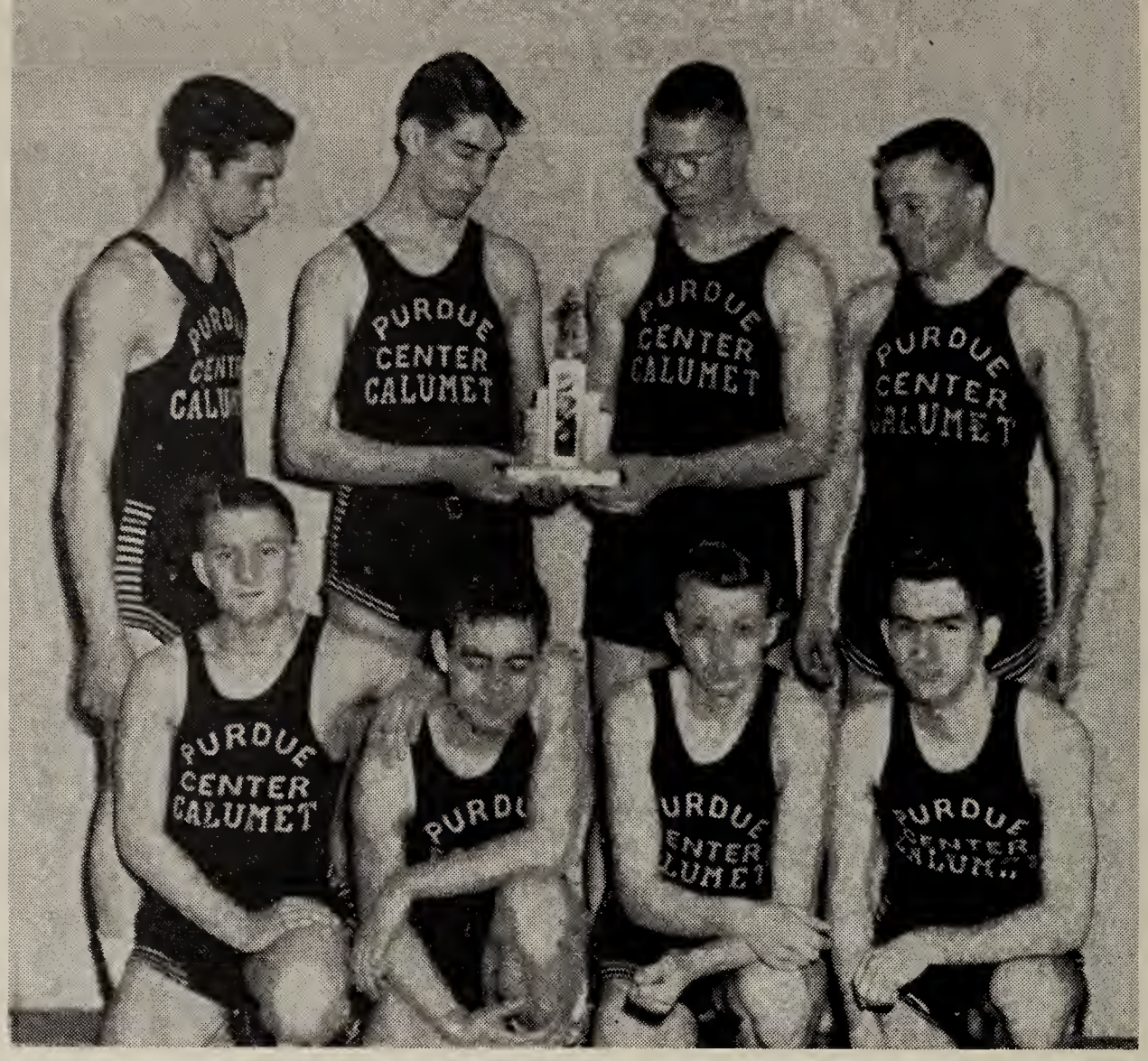
Must be preceded by Math. 141 and 142.
Mechanics, properties of matter, heat.

231. (2.) GENERAL PHYSICS. Class 4, Lect. Dem. 1, cr. 4⅓ $39

Must be preceded by Phys. 230.
Electricity, sound, light.

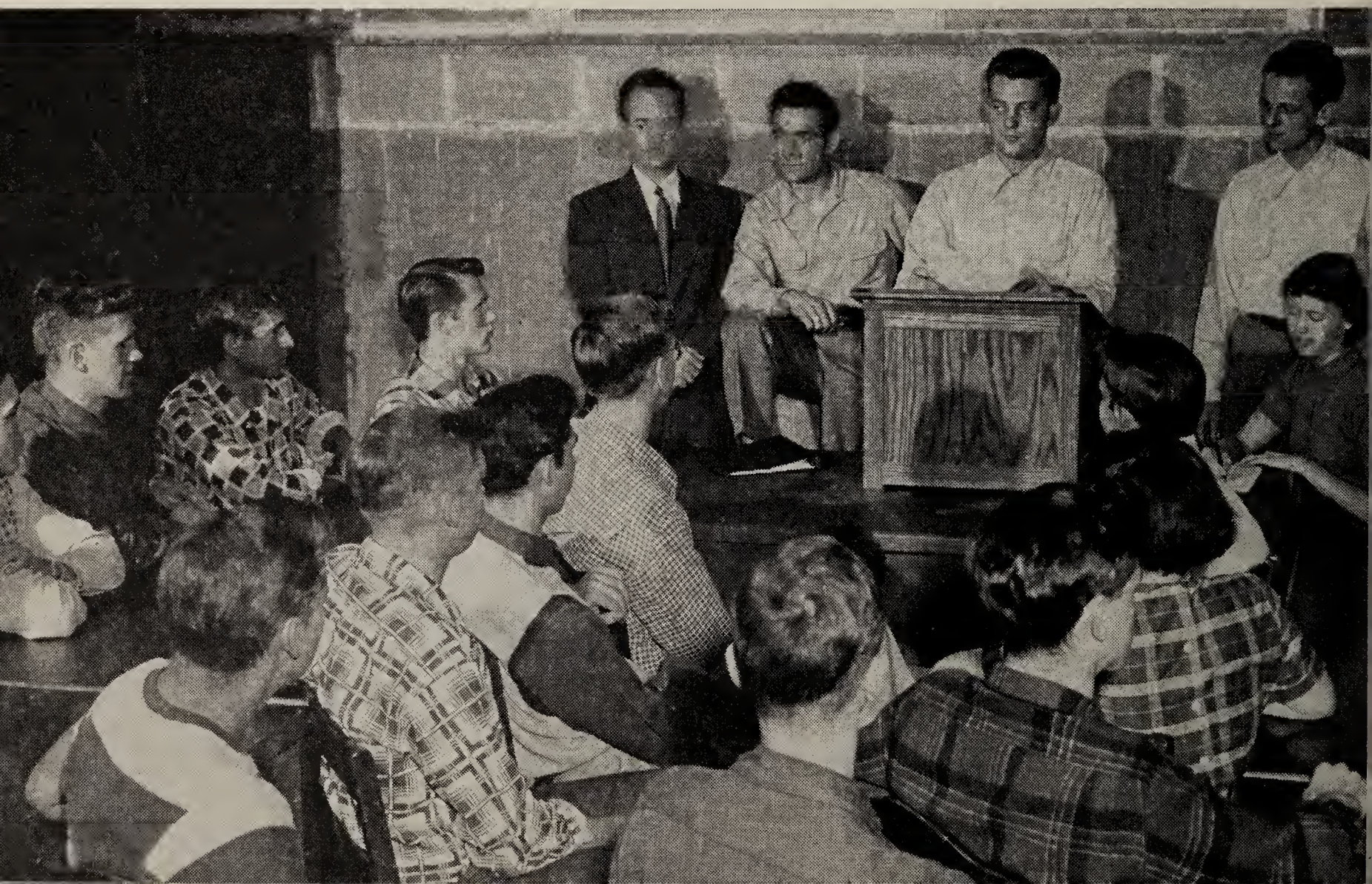
240. (21.) GENERAL PHYSICS. Class 4, Lect. Dem. 1, Lab. 2, cr. 5 $50

Must be preceded or accompanied by Math. 141 and 142.
Mechanics, properties of matter, heat, with illustrative laboratory experiments.



The 1952 winners of the Inter-Center Basketball Tournament, an annual event.

A student council performs an important governing function in each of the Centers.



241. (22.) GENERAL PHYSICS. Class 4, Lect. Dem. 1, Lab. 2, cr. 5 $50
Must be preceded by Phys. 240.
Electricity, sound, light, with illustrative laboratory experiments.

520. (105.) ACOUSTICS. Class 3, cr. 3 $24
Must be preceded by Math. 241 and 242 and by two terms of general physics.
Introduction to the acoustics of reproduction and communications systems; architectural acoustics; sound production and reception.

530. (106.) ELECTRICITY AND MAGNETISM. Class 3, cr. 3 $24
Must be preceded by Phys. 330 or E.E. 315, 316 or equivalent.
An introductory theoretical course. Vector analysis; electrostatic problems; theory of dielectrics; theory of conduction; thermoelectric and photoelectric phenomena; electromagnetic effects due to steady and changing currents; magnetic properties of matter; Maxwell's equations; radiation.

550. (124.) INTRODUCTION TO MODERN PHYSICS.
Class 3, cr. 3 $24
Must be preceded by Phys. 240, 241 and calculus.
Not available for graduate credit for Physics majors.
A historical survey of modern physics up to 1927. Kinetic theory; the electron; ions; isotopes; quantum theory of radiation; photons; Bohr theory of the atom; the spectrum of hydrogen; X-ray spectra; shell structure of the atom, and interpretation of the Periodic table.

556. (125.) INTRODUCTION TO MODERN PHYSICS.
Class 3, cr. 3 $24
Must be preceded by Phys. 550.
A continuation of Phys. 550 primarily for students outside the Department of Physics. Natural and artificial radioactivity; nuclear physics; relativity; astrophysics.

Speech

111.* (11.) PUBLIC SPEAKING. Class 2, cr. 2 $16
(Offered in extension centers only.)

112.* (12.) PUBLIC SPEAKING. Class 2, cr. 2 $16
Continuation of Spch. 111 and must be preceded by it.
Credit in Spch. 111 and 112 combined will be accepted in lieu of Spch. 114 or 116 where one of the latter courses is required for graduation. Credit may not be earned both in Spch. 114 or 116 and in the Spch. 111 and 112 combination.

114.* (14.) PRINCIPLES OF SPEECH. Class 3, cr. 3 $24

Division of Education and Applied Psychology

Education

260. (33.) PRINCIPLES AND OBJECTIVES OF TRADE AND INDUSTRIAL EDUCATION. Class 3, cr. 3 $24
Historical and legislative background for the development of trade and industrial education, objectives for operating the various types of schools and programs.

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* Credit in SPCH 111 and 112 combined may be accepted in lieu of SPCH 114 as a requirement for graduation. Credit may not be earned in both SPCH 114 and the SPCH 111 and 112 combination.

460. (15.) SPECIAL METHODS OF TEACHING TRADE AND INDUSTRIAL SUBJECTS. Class 3, cr. 3 $24

Must be preceded by Psy. 120 (1), 210 (2), and Educ. 300 (3), 304 (4).

Principles and procedures for teaching trade and industrial subjects.

467. (31.) SCHOOL SHOP MANAGEMENT. Class 3, cr. 3 $24

The school shop and drawing room, including equipment and management. Layout selection and arrangement of equipment and supplies; methods of organization and management.

468. (35.) OCCUPATIONAL AND TRADE ANALYSIS. Class 3, cr. 3 $24

Methods of analysis of trade and occupation to determine essential content for courses of study.

469. (39.) ORGANIZATION OF INSTRUCTION MATERIAL FOR TRADES AND INDUSTRIES. Class 3, cr. 3 $24

Must be preceded by Psy. 120 (1) and 210 (2), and Educ. 300 (3), 304 (4), and 468 (35.)

Application of governing principles to establish an effective arrangement for teaching content required for occupational courses in vocational schools and classes.

474. (163.) CONFERENCE LEADERSHIP TRAINING. cr. 2 or 3 $16 or $24

Training by the conference method, making use of devices, techniques, and material necessary to the work of the conference leader.

500. (101.) AUDIO-VISUAL AIDS FOR TEACHERS. Class 3, cr. 3 $24

Must be preceded by twelve hours of education and psychology.

Sources, selection and effective use of audio-visual aids and preparation of audio-visual materials.

504. (123.) INTRODUCTION TO MEASUREMENT AND EVALUATION. Class 3, cr. 3 $24

Introduction course in the theory and practice of measurement, with illustrations from education, industry, and business; emphasis on the guidance functions of the measuring devices studied.

510. (135.) PRINCIPLES AND PROBLEMS OF VOCATIONAL AND EDUCATIONAL GUIDANCE. Class 3, cr. 3 $24

Must be preceded by twelve hours of psychology and education or equivalent professional training.

The development of vocational and educational guidance in the home, school, industry, and service organizations; consideration of the principles and present practices in such guidance.

514. (112.) THE USE OF COMMUNITY RESOURCES IN GUIDANCE. Class 3, cr. 3 $24

Analysis and utilization of available community resources that have a bearing upon the development and activities of young people.

526. (190.) REMEDIAL READING. cr. 2 to 4 $8 per credit hour

Must be preceded by 12 hours in education and psychology.

Techniques in remedial reading for children, adolescents, and adults.

560. (118.) CURRICULUM DEVELOPMENT IN INDUSTRIAL ARTS. cr. 2 or 3 $16 or $24

564. (137.) TESTS AND MEASUREMENTS IN INDUSTRIAL EDUCATION. Class 3, cr. 3 $24

Must be preceded by Psy. 500 (131) or equivalent.

Designed for industrial education students as an alternative course for Educ. 504 (123). Concepts involved in testing and measuring, with applications in industry and industrial education.

566. (138.) EDUCATIONAL AND INDUSTRIAL COORDINATION.
cr. 1 to 3 $8 per credit hour

Must be preceded by Psy. 120 (1), 230 (2), and Educ. 300 (3), 304 (4), 469 (15), and 468 (35).

Common problems of education and industry, with emphasis on preparation for the work of the coordinator.

568. (139.) INSTRUCTION MATERIALS FOR TRADES AND INDUSTRIES. cr. 1 to 6 $8 per credit hour

Must be preceded by Psy. 120 (1), 230 (2), and Educ. 300 (3), 304 (4), 460 (15), and 468 (35), or by permission of instructors. (Not more than 3 hours may be accepted toward an advanced degree.)

Application of governing principles to establish an effective arrangement of teaching content required for occupational courses in vocational schools and classes.

572. (164.) PART-TIME AND EVENING-SCHOOL PROGRAMS IN INDUSTRIAL EDUCATION. cr. 1 to 3 $8 per credit hour

Senior standing or by special permission of instructor.

Problems faced by coordinators, supervisors, and administrators in operating part-time and evening schools, with special emphasis on public relations, teacher selection, in-service training, buildings and equipment.

574. (165.) PRINCIPLES AND PRACTICE OF TRAINING IN INDUSTRY.
Class 3, cr. 3 $24

Senior standing or by special permission of instructor.

Analysis of training needs; organization of training programs; typical training departments; basic principles of development; relationship of training department to other departments of the industrial plant.

590. (140.) INDIVIDUAL RESEARCH PROBLEMS.
cr. 1 to 6 $8 per credit hour

Must be preceded by six hours of psychology and six hours of education or equivalent professional training.

Opportunities for students to study particular problems under the guidance of a member of the staff. This plan of individualized instruction may be used in any field of education or vocational education. Does not include thesis work.

600. (187.) FOUNDATIONS OF EDUCATION. Class 3, cr. 3 $36

Must be preceded by twelve hours in education.

A systematic examination of the aims and purposes of education from the point of view of the needs of society, the basic needs of the child, and educational philosophy.

608. (232.) SEMINAR IN GENERAL EDUCATION. cr. 3 $36

Must be preceded by twelve hours in education, including Psy. 500 (131).

Study and original investigation of current practices and problems in education in accordance with the needs of individual students. Designed for candidates for the M.S. degree in Education, non-thesis option.

612. (133.) ORGANIZATION AND ADMINISTRATION OF GUIDANCE.
Class 3, cr. 3 $36

Must be preceded by Educ. 510 (135).

Procedures in organizing and administering guidance services; observation of programs operating in selected schools, industries, and service organizations, with particular emphasis on cooperative participation of various personnel.

620 (222.) SCHOOL CURRICULUM. cr. 2 or 3 $24 or $36

The objectives, organization, and administration of the secondary-school curriculum.

637. (227.) ORGANIZATION AND ADMINISTRATION OF VOCATIONAL EDUCATION. cr. 1 to 4 $12 per credit hour

Must be preceded by twelve hours in education or by equivalent professional training.

Major phases of vocational education: purpose, laws, administrative machinery, federal, state, and local; sources and expenditures of funds; kinds of classes and purposes of each; emphasis on vocational education in Indiana.

639. (194.) CLINIC FOR EDUCATIONAL LEADERS. cr. 1 to 4 $12 per credit hour

658. (230.) SEMINAR IN HOME ECONOMICS EDUCATION. cr. 2 to 6 $12 per credit hour

Must be preceded by twelve hours in education or by equivalent professional training.

Current problems in home economics education. May be repeated for credit.

668. (229.) SEMINAR IN VOCATIONAL TRADE AND INDUSTRIAL EDUCATION. Class 3, cr. 3 $36

Must be preceded by twelve hours in education or by equivalent professional training.

Recent research and current problems in vocational trade and industrial education.

696. (199.) RESEARCH IN TRADES AND INDUSTRIES. cr. 1 to 6 $12 per credit hour

Psychology

120.* (1.) ELEMENTARY PSYCHOLOGY. Class 3, cr. 3 $24

Introduction to the fundamental principles of psychology, covering particularly the topics of personality, intelligence, emotion, attention, perception, learning, memory, and thinking.

223. (3.) APPLIED PSYCHOLOGY. Class 3, cr. 3 $24

Must be preceded by Psy. 120 (1) or its equivalent.

A survey of the applications of psychology to problems in education, business, industry, medicine, and law.

230. (2.) EDUCATIONAL PSYCHOLOGY. Class 3, cr. 3 $24

Must be preceded by Psy. 120 (1).

Introduction to the problems of the pupil; educational adjustment, with emphasis on the application of psychological principles to teaching.

235. (9.) CHILD PSYCHOLOGY. Class 3, cr. 3 $24

Must be preceded by Psy. 120 (1) or its equivalent.

Age-level characteristics and needs of children from birth to the teens in motor control, language, learning, play, etc.; interpersonal relations and other factors affecting children.

340. (174.) GENERAL SOCIAL PSYCHOLOGY. Class 3, cr. 3 $24

Must be preceded by six hours of psychology or three hours of psychology and three hours of sociology.

Conditions and consequences of human behavior in social situations, with emphasis upon the mechanism and the processes on the basis of which socialization takes place.

350. (141.) ABNORMAL PSYCHOLOGY. Class 3, cr. 3 $24

Must be preceded by twelve hours of psychology.

Various forms of mental disorder from the standpoint of their origin, treatment, prevention, social significance, and relation to problems of normal human adjustment.

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* May be offered as a two-credit recitation course with special approval.

500. (131.) STATISTICAL METHODS APPLIED TO PSYCHOLOGY, EDUCATION, AND SOCIOLOGY. Class 2, Lab. 2, cr. 3 $27

Must be preceded by six hours of education and/or psychology and/or sociology.

Application of elementary statistical concepts, such as central tendency, variability correlation, validity, and reliability, to problems of psychology and mental measurements.

532. (156.) PSYCHOLOGY OF THE EXCEPTIONAL CHILD. Class 3, cr. 3 $24

Must be preceded by six semester hours of psychology.

Principles of diagnostic testing, adaptive teaching, and guidance applied to the improvement of teaching and to the correction of learning difficulties of exceptional children.

533. (109.) PROBLEMS IN CHILD PSYCHOLOGY. Class 3, cr. 3 $24

Must be preceded by six semester hours of psychology.

Development of the child from birth to adolescence, with special study of such topics as play, sex differences, and learning at different age levels.

537. (103.) MENTAL HYGIENE IN EDUCATION. Class 3, cr. 3 $24

Must be preceded by Psy. 120 (1) and 230 (2).

General principles of mental and emotional health and how to set up constructive conditions for the years of childhood and youth; the child in relation to parents, teachers, and children.

550. (153.) INTRODUCTION TO CLINICAL PSYCHOLOGY. Class 3, cr. 3 $24

Must be preceded by twelve hours of psychology.

The case-study method, including a discussion of the importance of historical information, the contribution of clinical tests to diagnosis, and a general survey of prevention and treatment techniques.

570. (173.) PERSONNEL PSYCHOLOGY. Class 3, cr. 3 $24

Introduction to psychology through the topics of individual differences, aptitude testing, merit ratings, industrial safety motivation, morale, and training.

Sociology

100. (1.) INTRODUCTORY SOCIOLOGY. Class 3, cr. 3 $24

Science and principles of human relationships; social organization, social forces and social control.

220. (11.) SOCIAL PROBLEMS. Class 3, cr. 3 $24

Major social problems of the day—social conflict, family breakdown, the physically and mentally handicapped, poverty, crime, etc.; modern trends in prevention and treatment.

330. (41.) RURAL SOCIOLOGY. Class 3, cr. 3 $24

The structure and functions of rural society; rural people, groups, institutions, and organizations; current social problems in rural society.

334. (51.) URBAN SOCIOLOGY. Class 3, cr. 3 $24

Nature and ecology of urban societies; types of social behavior in cities; metropolitan regions and city planning with emphasis upon the usefulness of the city.

350. (71.) MARRIAGE AND FAMILY RELATIONSHIPS. Class 3, cr. 3 $24

(See F.L. 350 (71). Catalog of School of Home Economics.)

Open to both men and women of junior and senior standing.

553. (173.) THE SOCIOLOGY OF THE FAMILY.
Class 3, cr. 3 $24

Must be preceded by Soc. 100 (1) or equivalent.

History and development of the family as a social institution, with emphasis on problems and processes of the contemporary American family.

555. (175.) FAMILY LIFE EDUCATION. Class 2, Lab. 2, cr. 3 $27

Must be preceded by 15 hours from Education, Family Life, Psychology and Sociology.

Designed especially for teachers and prospective teachers. Discussion of courtship, marriage, and family relationships. Special attention to methods and materials of instruction.

570 (182.) SOCIAL BASES OF EDUCATION. Class 3, cr. 3 $24

Must be preceded by Psy. 120 (1) and Soc. 100 (1).

Sociological interpretation and evaluation of school and non-school education.

Division of Physical Education for Men

112. (12). PHYSICAL ACTIVITIES. Lab. 3, cr. 1 $15

380. (80.) FIRST AID AND SAFETY. Class 1, Lab. 2, cr. 2 $21

502. (167.) ORGANIZATION OF CHORAL AND ORCHESTRAL RECREATION. Class 3, cr. 3 $24

The organization, direction, and maintenance of choral and instrumental recreation, with special emphasis on non-technical approach which will make music attractive to industrial employees and an employee activity.

504. (195.) ORGANIZATION AND ADMINISTRATION OF THE SCHOOL HEALTH PROGRAM. Class 3, cr. 3 $24

Emphasis upon the education aspects of the school health program and the personnel relationships involved in home, school, and community.

565. (265.) PRINCIPLES AND PRACTICES IN INDUSTRIAL RECREATION. Class 3, cr. 3 $24

Must be preceded by P.E.M. 308 and 391 or equivalent.

The best accepted practices in industrial recreation and the principles underlying these practices.

585. (285.) SEMINAR IN PHYSICAL EDUCATION.
Class 3, cr. 3 $24

Must be preceded by at least 24 semester hours in physical education.

Research techniques and literature bearing on the educational objectives of physical education.

Physical Education for Women

201. (53.) PHYSICAL EDUCATION. Lab. 2, cr. 1 $10

Improvement of personal technique in motor skills that have high leisure-time value and contribute to maintenance of physical well-being.

202. (54.) PHYSICAL EDUCATION. Lab. 2, cr. 1 $10

Continuation of P.E.W. 201.

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INDEX

Abbreviation key 10
Addresses, extension centers .....OBC
Administrative officers ... .IBC
Admission
  requirements 5
  deficiencies 5
Aeronautical engineering and air
  transport, school of 19
Agricultural economics, courses in..... 18
Agriculture, school of 18
Agronomy, courses in 18
Animal husbandry, courses in 18
Applied design, courses in 27

Bacteriology, courses in 30
Biological sciences 29
Biology, courses in 29

Chemical and metallurgical engineering
  and geology 20
Chemical engineering, courses in..... 20
Chemistry, courses in 30
Civil engineering and engineering
  mechanics, school of 21
Civil engineering, courses in..... 21
Clothing and textiles, courses in 27
Correspondence study 9

Dairy husbandry, courses in 19
Degree credit courses 4
Description of courses 18
Distinguished students 7

Economics, courses in 33
Education and applied psychology,
  division of 39
Education, courses in 39
Electrical engineering, school of 22
Electrical engineering, courses in 22
Engineering and economic geology,
  courses in 20
Engineering mechanics, courses in..... 22
Engineering students 7
English, courses in 32
Entomology, courses in 19
Examinations,
  orientation 6
  placement 6

Family life, courses in 27
Fees 8
Foods and nutrition, courses in 27
Forestry, courses in 19
French, courses in 36
Freshman plans of study 11
Freshman work 4

General engineering, department of 23
  courses in 23
German, courses in 36
Government, courses in 34
Grades and honors 6

History, courses in 33
Home economics, school of 27
Home management, courses in 28
Horticulture, courses in 19

Institution management, courses in 28

Mathematics, courses in 34
Mechanical engineering,
  school of 26
  courses in 26
Metallurgical engineering, courses in 20
Modern languages 36

Non-credit courses 4

Off-campus program 4
Orientation examination 6

Pharmacy, school of 28
Physical education 44
Physics, courses in 37
Placement examination 6
Plans of study 11
Plant science, courses in 30
Poultry husbandry, courses in 19
Probation 7
Psychology, courses in 42

Refunds, fees 8
Requirements for admission 5
Russian, courses in 37

Scholarhsip index 7
School of science 29
Sociology, courses in 43
Spanish, courses in 37
Special services for industry 4
Specch, courses in 39
Students,
  distinguished 7
  engineering 7
Study, correspondence 9
Study plans 11
Subject matter supervisors 45

Teaching staff 45

Withdrawal 8

Zoology, courses in 30

Adult education programs include a variety of recreational activities including square dancing and fishing.

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